THE AUSTRALIAN BICENTENNIAL

AIR SHOW

THE OFFICIAL SOUVENIR MAGAZINE

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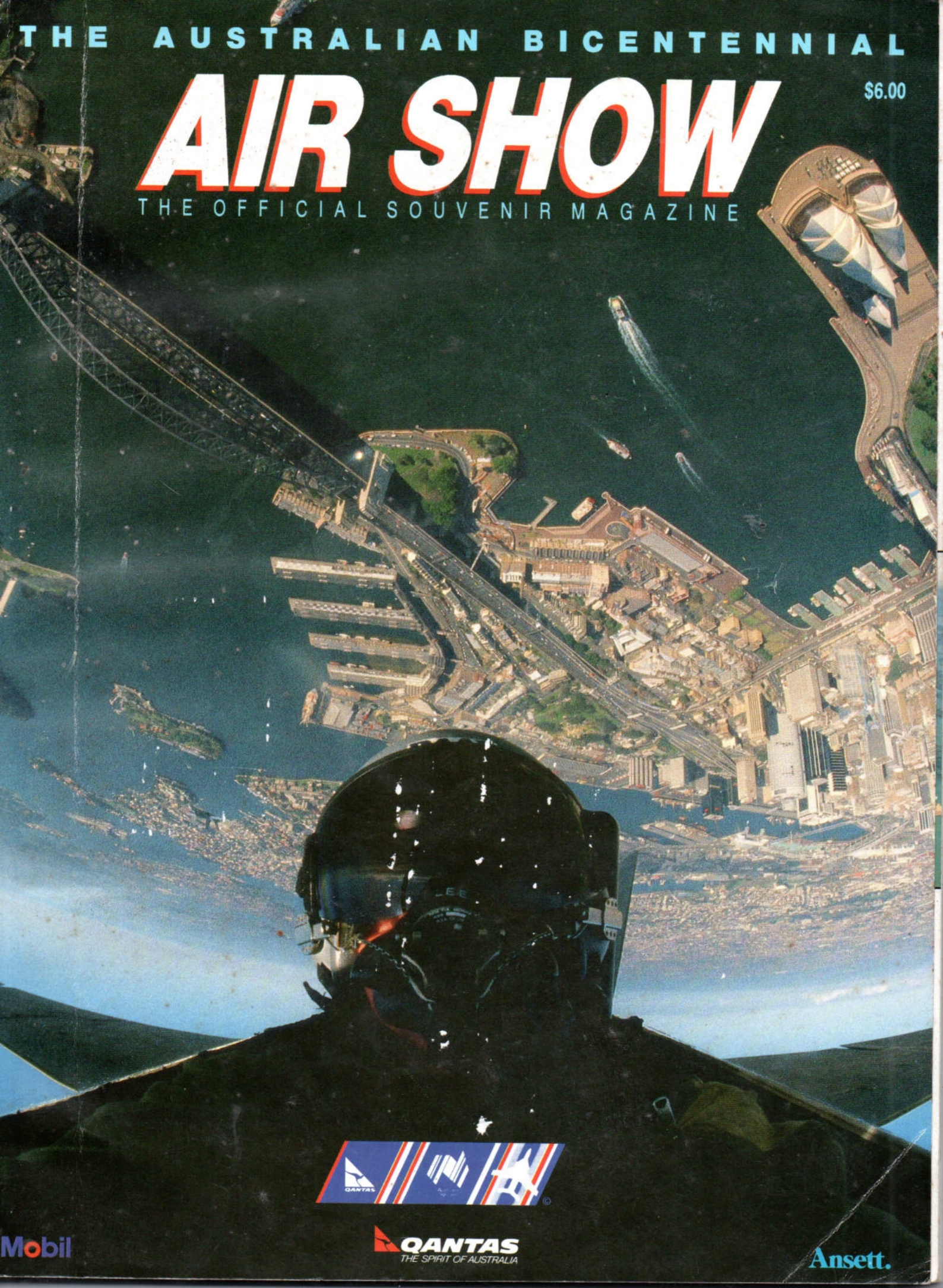

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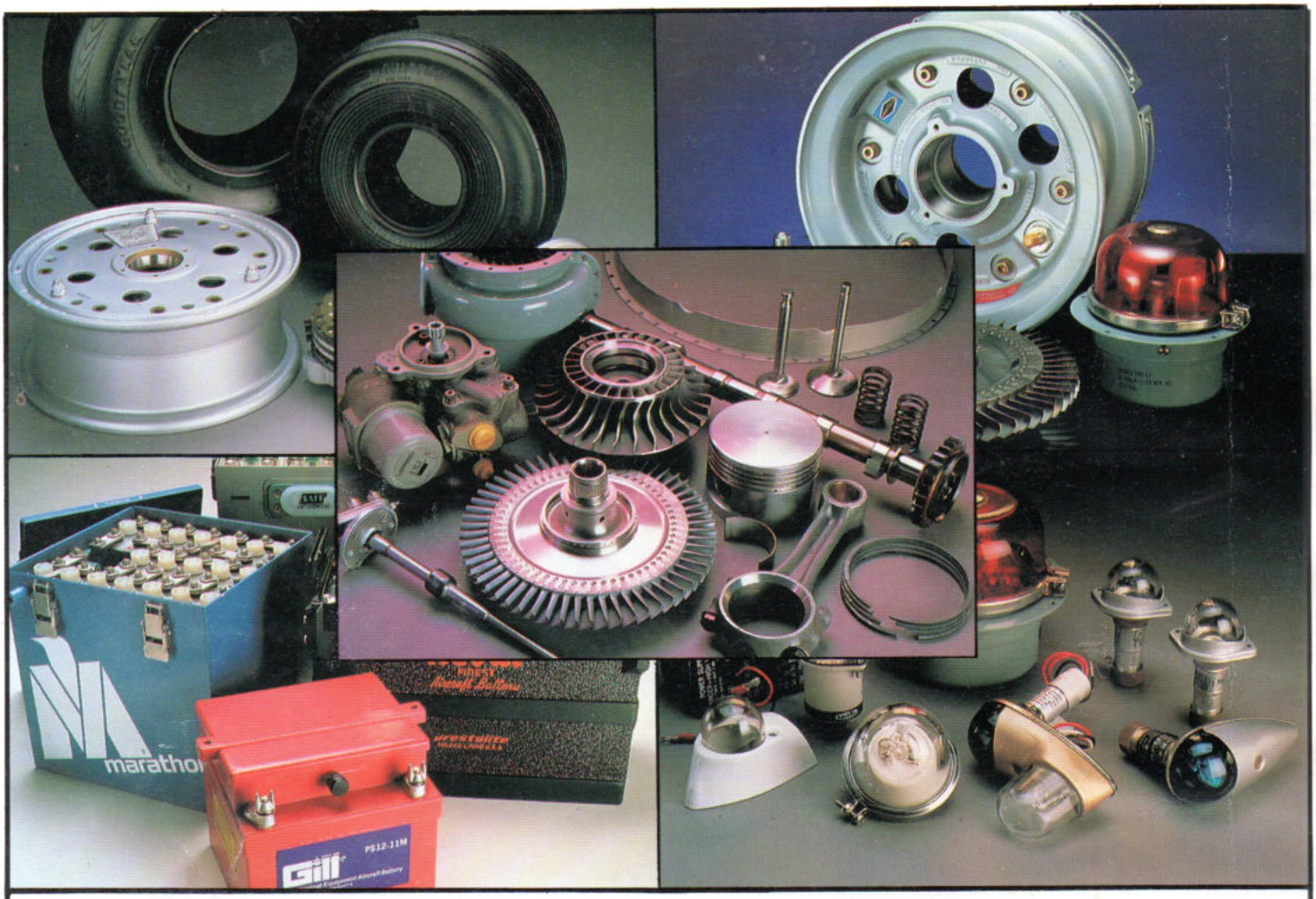

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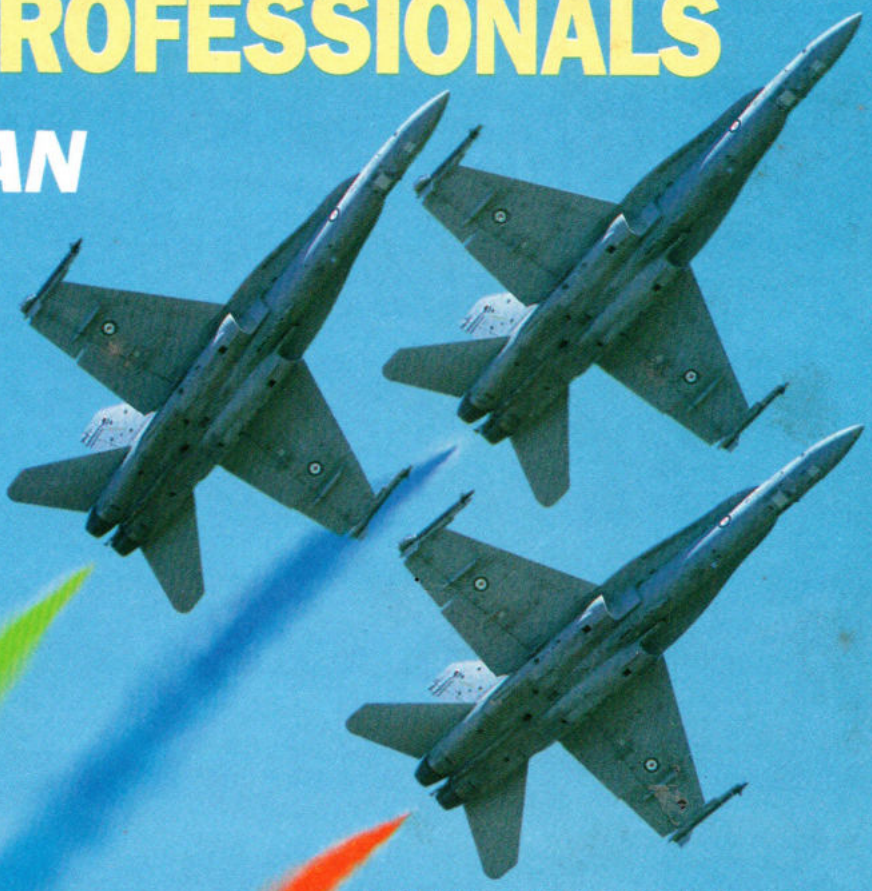
THE AUSTRALIAN BICENTENNIAL AIR SHOW & THE PRO-IMAGE GROUP



Staging an aviation spectacular like the AUSTRALIAN BICENTENNIAL AIR SHOW requires technical expertise, professionalism, finely tuned equipment and teamwork.
Rather like the qualities needed to operate one of Australia's leading television and video production companies –
THE PRO-IMAGE GROUP.

THE PRO-IMAGE GROUP, which holds exclusive international coverage rights to the AUSTRALIAN BICENTENNIAL AIR SHOW, congratulates the organisational committee, sponsors and participants and welcomes all overseas delegates to this unique Bicentenary celebration.

We are proud of our team's involvement in the following areas:–

PRO-IMAGE TELEVISION will ***produce and market*** a 60-minute documentary on the Air Show.

PRO-IMAGE OUTSIDE BROADCAST DIVISION will ***record*** the entire event.

PRO-IMAGE PRODUCTIONS (S.A.) will ***edit*** the one-hour television documentary, as well as the videocassette and international television programmes.

PRO-IMAGE CORPORATE COMMUNICATIONS will custom-produce corporate ***audio-visual presentations*** for many of the Air Show Trade Expo Exhibitors.

COMMUNICATIONS AND ENTERTAINMENT LIMITED will ***duplicate, distribute and market*** the Official Limited Edition videocassette of the Air Show.

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The Australian Bicentennial Air Show

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MESSAGES OF WELCOME

Ian Honnery
Executive Chairman
Australian Bicentennial Air Show Organisation

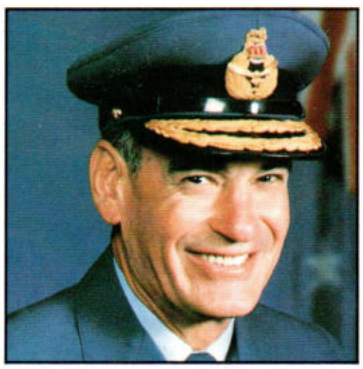
As we begin to take part in and enjoy these five days of the international Aerospace Expo and the flying and static displays at the Australian Bicentennial Air Show, it is difficult to comprehend that it is the end result of years of detailed planning and vigorous work.

When we began to organise this aviation centrepiece of Australia's Bicentenary, we had in mind to bring to Australians the features of the great air shows of the Northern Hemisphere, at Paris, Farnborough, Oshkosh, the International Air Tattoo, and so on.

What we have achieved, and the response from the Australian and world aviation and aerospace industries, has been far in excess of our most optimistic expectations. That response, we believe, reflects enormously on Australia, and its standing in the world aerospace and military aviation communities.

We can also draw pride from the fact that the Australian Bicentennial Air Show has drawn together almost every aviation organisation in Australia, from our commercial sponsors, Qantas, Ansett and Mobil, through all branches of the Australian Defence Forces, the Civil Aviation Authority, the Department of Transport and Communications and a very wide variety of professional, industry, business and sporting aviation groups.

It is no exaggeration to say that Australians will not see an aviation event as large and as comprehensive as this for probably another 200 years. The organisation of the Australian Bicentennial Air Show has taken more than 50,000 person hours of effort by a small, salaried secretariat and a huge volunteer workforce. The intensity of the work has, at times, been enormous; but if it helps to make the Australian public, and the world, aware of what we have achieved in aviation, and what we are capable of in the future, then it will have all been worthwhile.



Air Marshal R.G. Funnell, AO
Chief of Air Staff
Royal Australian Air Force

Welcome to the Australian Bicentennial Air Show, and thank you for choosing to join us for this unique Australian aviation event.

Like all professional aviators, I enjoy an air show immensely and have been attending them since I was a small boy. Now, we have for the first time in Australia a show that rivals the great air shows of the world and, in its scope, probably surpasses them. The RAAF is proud to be a part of this major Bicentennial undertaking.

The ground on which you stand has been an important part of the RAAF for more than 60 years, and today RAAF Base Richmond forms the hub of our worldwide air transport operations. Its adaptation to an air show venue has required imagination, skill and much hard work. I trust that the outcome satisfies our objectives.

The five long years of planning upon which this great occasion has been based have now reached fruition. The Air Show with its rich variety of ground and air displays is about to begin. It has been designed as a dynamic celebration of Australian aviation, yesterday, today and tomorrow. Please join this nation's Air Force in enjoying it to the full.

Pioneering the Skies

Today's aviation structure has emerged with breathtaking speed. John Stackhouse examines its origins in Australia

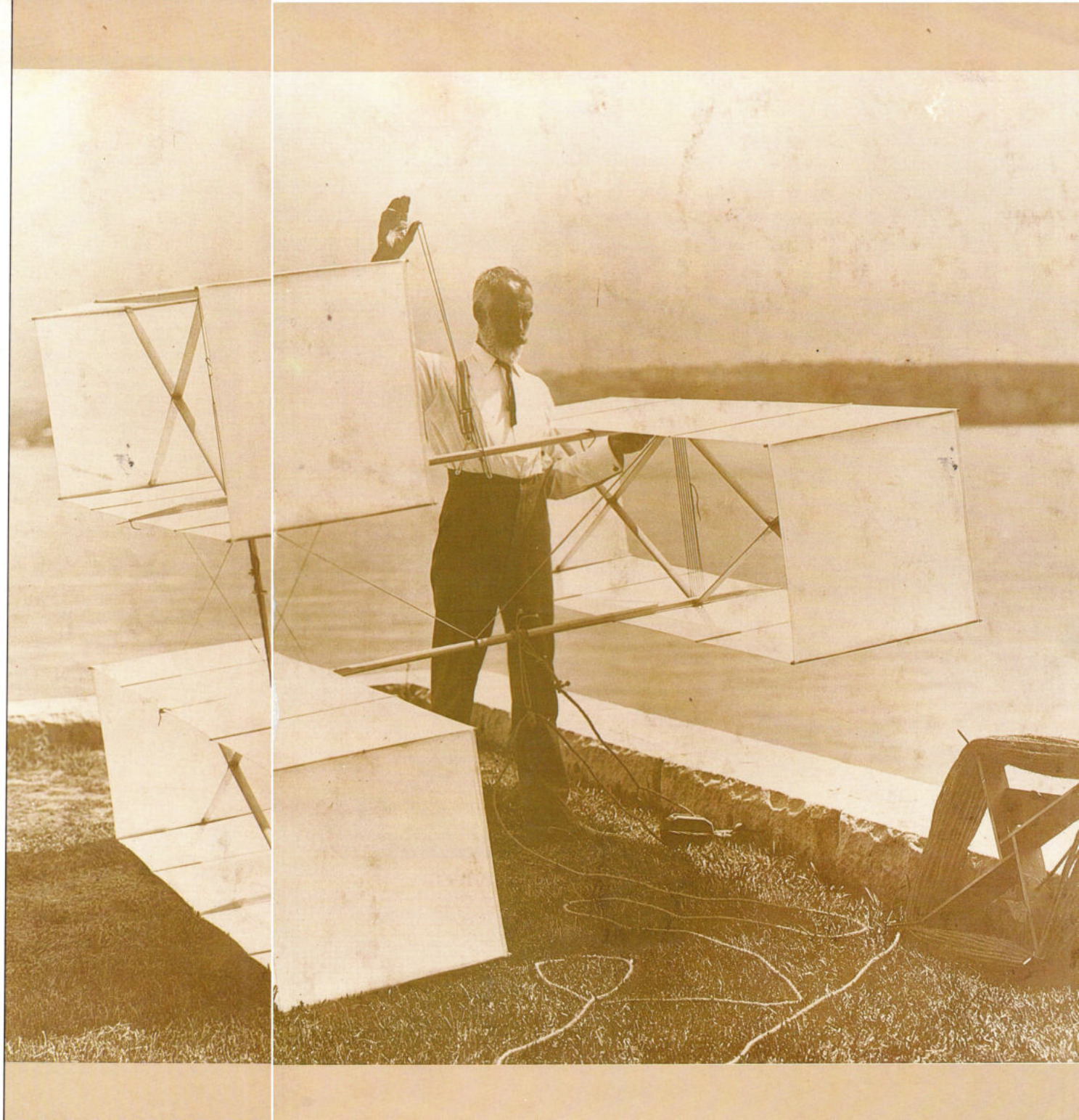
Pages of history and, at right, Lawrence Hargraves

Australia's aviation history started with an air show of sorts, a display where the aeronaut didn't get off the ground and which ended in a riot. It was back in 1856. A Frenchman, Pierre Maigre, invited the people of Sydney to the Domain to witness the first balloon ascent in Australia. He promised an entertaining display and charged the spectators for the privilege of watching.

Unfortunately, the fabric making up the balloon ripped, the flight was abandoned, and the crowd then charged Maigre. Remember, Sydney had a fairly desperate population in those days, so Maigre took to his heels and dived into Government House seeking sanctuary. Enraged, the crowd stormed back to the balloon, its stands and equipment, and entertained itself by burning the lot. Eleven-year-old Thomas Downs was hit by one of the posts being torn down and died of a fractured skull.

With the riot still relatively fresh in potential aviators' minds, it is understandable that the next — and this time successful — balloon attempt took place in Melbourne about 14 months later. On February 1, 1858, an English aeronaut, William Dean, ascended in a gas balloon, *Australasian*, from the Cremorne Gardens. The 20m-high, English-built balloon drifted for about 12km before it came down. On the second flight a couple of weeks later, Dean's partner C.H. Brown also took off from Cremorne Gardens, drifted out to the wild country between Collingwood and Brunswick and, as historian Ron Gibson reports, was attacked by the locals.

Although these were the first successful flights in Australia, there are earlier records of research and experimentation into powered and unpowered heavier-than-air attempts. Back in 1843, Francis Forbes of Muswellbrook, NSW, wrote to newspapers



The Bicentennial Air Show. Proudly sponsored by the First Fleet.

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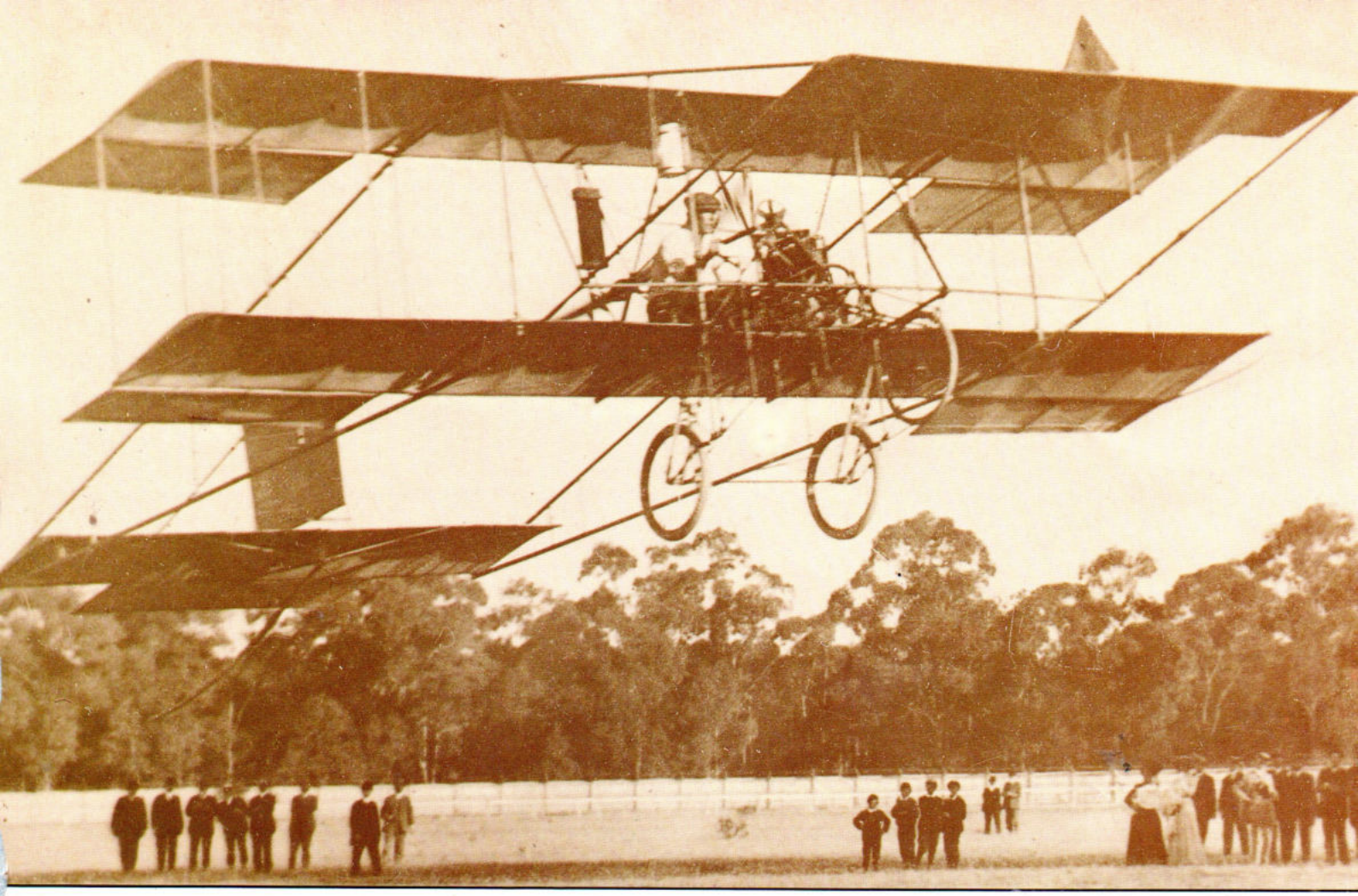
Richmond Airforce Base, 12th to 16th October, 1988.



describing a model flying machine he was building. However, no other records of it remain.

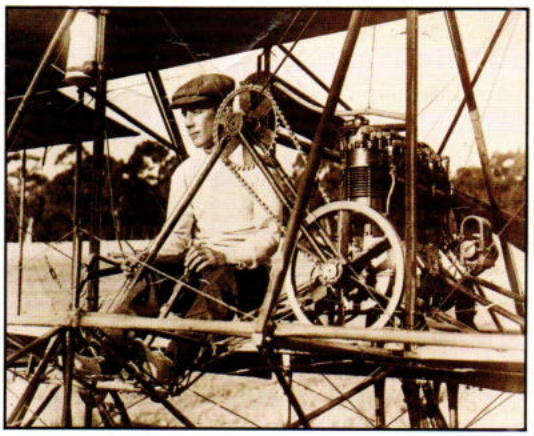
Forbes was friendly with the eccentric Sydney personality and politician Dr William Bland, who designed in 1851 what he called an atmotic ship — a hydrogen-filled, steam-powered semi-rigid airship about 30m long and capable, he estimated, of lifting about 1.5 tonnes. Bland, convinced it would fly from Sydney to London in four or five days, prepared drawings and a model and wrote to Queen Victoria and President Abraham Lincoln about his invention. The plans went on display at the Crystal Palace in London and at the Paris exhibition of 1855.

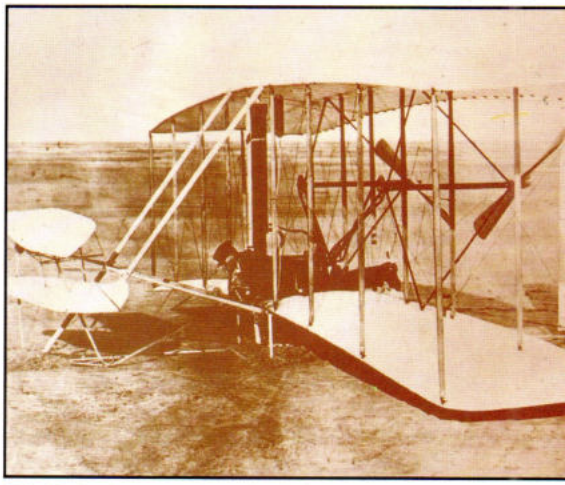
Nobody built a prototype that would have tested Bland's assertions. To make the London-Sydney journey in five days (a time which did not become a reality until the Victorian Centenary Air Race of 1934 was won in just under three days), the atmotic ship would have had to maintain an average speed of about 160km/h. Gibson, in his index to aviation events, reports a suggestion that the German Graf von Zeppelin borrowed some of Bland's ideas for his dirigibles, but says he could not confirm it.

It now seems fairly certain, however, that in heavier-than-air flight, Australian ideas greatly influenced the eventual mainstream of aviation. The experimenter Lawrence Hargraves, whose models are now displayed in Sydney's Powerhouse Museum, developed a boxkite design which was used in early aircraft, and also worked on control systems, engines and propellers. He actually got off the ground — an array of four boxkites lifted him 5m.

Powered flight in Australia came several years after the Wright brothers first flew in the United States. George Taylor, who founded the Aerial League in Australia (perhaps the first local pressure group in aviation) opened an aeroplane factory in Sydney which may (or may not) have constructed three aeroplanes. The incentive was a government prize of £5000, (nominally equivalent to $10,000 but equivalent in presentday values to about $550,000) for the best aeroplane for military use designed by a natural-born Australian or a British subject living in Australia. As far as possible, it also had to be constructed in Australia, rise from the ground "without appreciable delay" under its own power, achieve a speed of 20 miles an hour (about 30km/h) and remain over a certain area long enough for military observations to be carried out. There were no entrants, and the offer was eventually withdrawn.

In December 1909, Taylor became the first Australian to fly (in a glider at





John Duigan's biplane, the first Australian-built plane to fly on July 16, 1910, at top; Duigan at the controls; a Wright brothers' aircraft

Narrabeen, NSW), and his wife Florence later became the first woman to fly in Australia. George covered about 10m and Florence about 90m.

A few days later, Colin Defries reportedly flew in a biplane derived from a Wright design at Victoria Racecourse in Sydney, and repeated the feat a few days later. On this occasion, Defries wobbled into the air, his hat blew off, he grabbed for it and crashed. Taylor later claimed Defries hadn't really flown because he didn't have control. However, Gibson says he achieved heights of between a metre and about 5m. In March 1910, the machine was taken to Melbourne and Ralph Banks made a flight at Diggers Rest, just outside the city. He rose to 5m and flew about 300m before the machine nose-dived into the ground and was wrecked. Banks emerged with a black eye and a cut lip.

The honours for the first controlled flight go to Fred Custance at Bolivar, near Adelaide, on March 17, 1910. Custance flew a Bleriot owned by F.H. Jones for five minutes, 25 seconds, completed three circuits of a large paddock and achieved a height of about 15m. On a second attempt, Custance over-controlled and crashed. He just beat escapologist Harry Houdini (whose real name was Eric Weiss). The next day, Houdini made several flights in a Voisin at Diggers Rest, achieving heights of more than 30m and distances of about 4km.

By this time, several Australians were building their own aeroplanes and taking to the air, and overseas manufacturers were trying to interest the Australian government in their machines. Bristol commissioned New Zealander Joseph Hammond to demonstrate its boxkites. Hammond made a flight of 45 minutes in January 1911 and the next month took his wife aloft in the first passenger-carrying flight in Australia. Within a short time, aviation was firmly established, and in July 1914, a French aviator carried a special air mail of 1785 cards and letters from Melbourne to Sydney. The trip took two days.

It was in these years that Richmond first appeared in aviation records. Energetic aviation lobbyist and early pilot W.E. Hart set up Harts Aviation Co., which established itself on Ham Common, near Richmond, later the site of the RAAF Base where the Bicentennial Air Show is being held. Hart also became the first aviator to fall foul of the law. He was charged in the Sydney District Court of "propelling or causing to be propelled for a long time an aeroplane over, upon and above the plaintiff's land and making a great noise and disturbance therewith frightened, disturbed and stampeded a herd of dairy cows, whereby two of the cows were killed and others injured". Hart had to pay £20 in compensation.

Several Australians travelled to Britain to fly. One of them, Eric Harrison, was appointed first chief instructor of the Spanish army's aviation school in Madrid. Another, Harry Hawker, began to claim endurance and height records in the UK and went on to give his name to the company that made some of Britain's most famous planes. When the Australian Defence Department established its first aviation school (at Duntroon, Canberra), Harrison was recruited with H. Petre (known as "the monk"). Petre, the first to arrive, declared Canberra unsuitable because of the hills, choosing instead the flat country outside Melbourne, which was then Point Cooke (now Point Cook).

The outbreak of war sped the development of aviation. Australia sent No. 1 Squadron, Australian Flying Corps, to Egypt, while other Australians flew with the Royal Flying Corps. When they came home, they returned with the dream of using aeroplanes to overcome the problems of Australia's vast distances, carrying passengers and freight, bringing health and religion to the outback, and even linking Australia and the Mother Country by air.

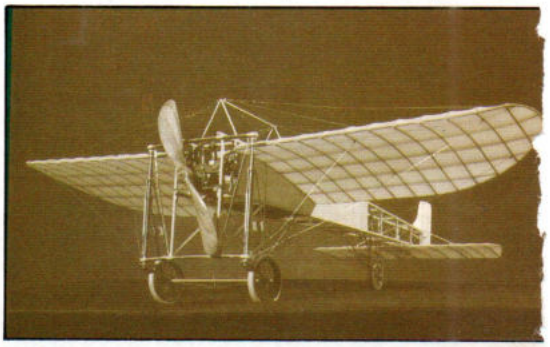
The Commonwealth government offered a prize of £10,000 for the first flight by an Australian from Britain to Australia in a British aircraft within 30 days. Lieutenants Ross and Keith Smith, with Sergeants J.M. Bennett and W.H. Shiers, won the prize, completing the journey of about 18,000 miles to Darwin on November 12, 1919, in just less than 136 hours' flying time, over 27 days' elapsed time. They flew a long-range Vickers Vimy bomber.

One of the first to greet the winners was a returned Australian observer and air gunner, Hudson Fysh, who had learned to fly at the end of the war. The Commonwealth commissioned Fysh and his skipper, P.J. McGinness, to find landing ground at Darwin and refuelling points between. A chance encounter near Cloncurry with grazier Fergus McMaster, whose car had broken down in a sandy riverbed, led McGinness and later Fysh to propose setting up the Queensland and Northern Territory Aerial Services. It was launched in Winton in 1921, financed by McMaster and his grazier friends. War surplus aircraft were used — an Avro 504 trainer and a BE2E. McGinness delivered the Avro from Sydney, picking up McMaster in Barcaldine, Queensland, and flying him through Longreach to Winton. Scheduled services, subsidised by the government, began between Charleville, Tambo, Blackall, Longreach, Winton, McKinley and Cloncurry (a distance of about 925km) in November 1922.

Almost a year earlier, the first Australian service under the government's subsidy scheme was started. Established by Norman (later Sir Norman) Brearley, Western Australian Airways flew Geraldton - Carnarvon - Onslow - Roebourne - Port Hedland - Broome, using Bristol Tourers. Among the pilots was a gifted airman with a somewhat harum-scarum reputation, named Charles Kingsford-Smith. WAA is remembered as the ancestor of Ansett WA, part of today's Ansett group.

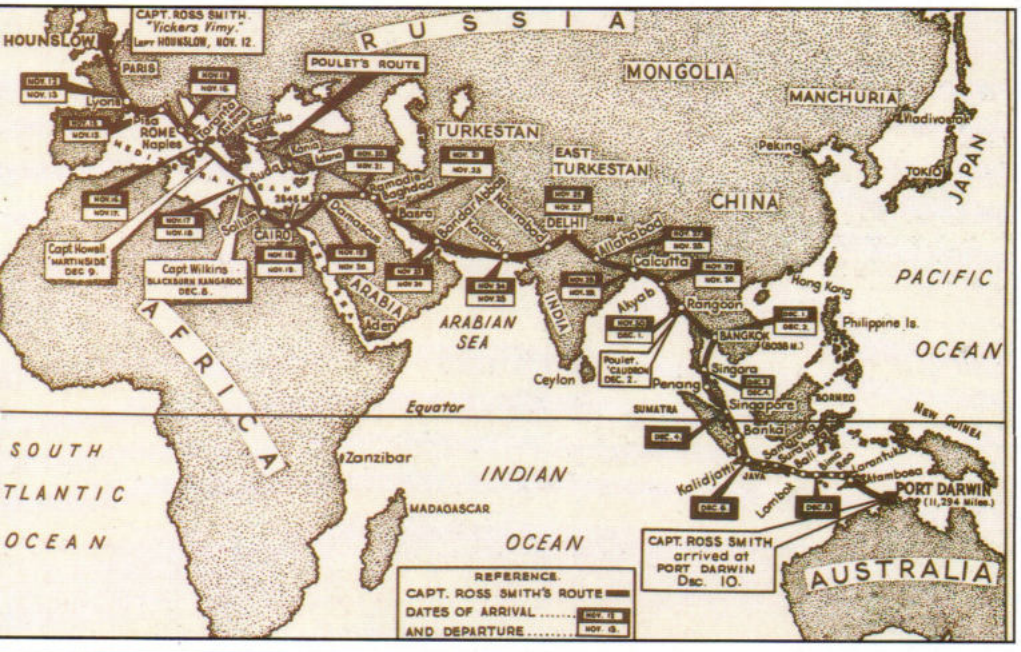
There was intense interest in aviation in Australia in those early days. Hudson Fysh, for instance, once compared the fliers of that era with the astronauts of the '60s and '70s. When they arrived in an outback town wearing their helmets, goggles and leather flying gear, they were treated as heroes. Newspapers and popular songs chronicled their activities as they completed their first flights around and across Australia and then turned their attention to the challenge of distances between Australia and Europe on one hand and North America on the other.

At first, the UK-Australia route held the main interest. Alan (later Sir Alan)



Cobham made the first return flight in 1926. After a tragic outbound trip on which his mechanic was killed, he took more than two months to reach Darwin, but returned in only about six weeks. Queensland's Bert Hinkler made the first solo flight in his tiny Avian in February 1928, taking 15 days. Over succeeding months, the time was lowered to 12 days, then nine, eight, and seven.

By this time, what we can now re-



Clockwise from top, Kingsford Smith lands after crossing the Pacific; Ross Smith's route f England; Smith triumphant at Darwin; and Custance's plane, f first to fly in Australia

gard as an Australian philosophy of aviation had begun to develop. Flying in Europe and the US was regarded as dashing and daring whereas Australians tended to be prudent and skilful.

The peer of this generation — and probably the world's best pilot in his time — was Charles Kingsford-Smith. With Charles Ulm and the Americans Harry Lyon and Jack Warner, "Smithy" completed the first crossing of the Pacific in June 1928. The flight time in the "Old Bus" — the three-engined *Southern Cross* (a replica of which will fly into Richmond) — was 83 hours. This flight demonstrated the organising ability of Ulm, whose dogged determination helped win American sponsorship to make the flight possible, but above all it highlighted the incredible piloting skill of Kingsford-Smith. Smithy used guile and sheer brute force to fly a sadly overloaded plane through mid-Pacific storms that would have tossed anyone else out of the sky. After hours of disorientation, Smithy brought his plane precisely into the tiny landing ground at Suva in Fiji.

But success was to elude both Smithy and Ulm. They were ahead of their time when they launched Australian National Airways (not the later ANA which was folded into Ansett), but the airline, after setting new standards of commercial and operating reliability, failed after the effects of the fatal loss of the *Southern Cloud* and the effects of the Depression. Both Ulm and Smithy became strapped to a wheel of rising expectations. To keep up the publicity needed to attract the sponsorship their dreams demanded, they had to take greater and greater chances. Finally, they pushed themselves too far; both disappeared while making record-breaking attempts.

A contributor to Smithy's loss was the buy-British rule that governed aviation until just before the Second World War. Smithy wanted to use a Lockheed racer in the 1934 air race, but was ruled out. On a flight from London which showed what he might have done, the engine packed it in off Burma, and Smithy was lost.

Apart from being the era of record-breaking flights, the '30s also saw the pattern of modern air transport beginning to develop. Through the '20s, a handful of small airlines began operating in Australia. Like Qantas and WAA,

Clockwise from top: humble beginnings — the early Qantas office at Longreach, 1921; dash and elation in Kingsford Smith and Ulm; a shot cattlehand is rushed 2000km to a Brisbane hospital in 1931, the early days of the Flying Doctor Service, using aircraft supplied by Qantas; the adulation of a nation: crew of the Southern Cross motoring through Brisbane in 1928; a youthful Sir Reginald Ansett alongside an early Fokker; and an early Qantas Dragon Rapide

HISTORY OF AUSTRALIAN AVIATION

they flourished in remote areas. The strange Qantas route pattern in the west makes sense when you look at the way the Queensland railways fingered in from the coast — the Qantas stops linked the railheads. In other parts of Australia, the railways blocked the development of air transport. For instance, the first mail flights from Britain weren't allowed to land in a capital such as Sydney or Melbourne. They terminated in Cootamundra, NSW, and the mail bags went on to the train.

Most air services existed only on government subsidies, and the competition for grants led to feuding and lobbying on what was for those days a gigantic scale. The plum was the proposed Empire air route linking Australia with Britain. With the Dutch spreading their wings out to Batavia (now Jakarta) and wanting to go on to Australia, a "British" route became politically essential. Britain's Imperial Airways commanded immense influence in both Britain and Australia, and eventually Imperial chose Qantas as a partner, forming Qantas Empire Airways.

At first, Qantas flew only to Singapore. But in the late '30s, Imperial commissioned the huge (for those days) Empire flying boats, which QEA also bought, and the "all-red" Australia-UK Kangaroo route was born.

After Smithy's and Ulm's ANA had folded, the Holyman shipping family started a new Australian National Airlines, which eventually bought the new Douglas airliners that were becoming available with the easing of the bans on non-British equipment in 1935. ANA grew and flourished through the war, but fell on hard times after the war.

Meanwhile, in western Victoria, a young entrepreneur, R.M. (later Sir Reginald) Ansett, was having trouble with his bus run. The Victorian Railways didn't welcome competition and the State Attorney-General, the up and coming Bob (later Sir Robert) Menzies, was doing his best to put Ansett out of action. Ansett, a pilot who had financed his business by winning a lucrative air race, bought himself a Fokker Universal and jumped over the railways, flying from Hamilton to Melbourne. Later, Ansett bought the fast Lockheed Electras just coming onto the market and started to give Australian National Airlines a run for its money. But then the war intervened.

For Ansett, the war was a period of tremendous growth. Ansett's fleet became the US courier service in Australia. He expanded his maintenance base on military contract work so that when peace came he was in a position to resume services, using converted war-surplus Douglas DC3s, backed by his now national Pioneer bus services.

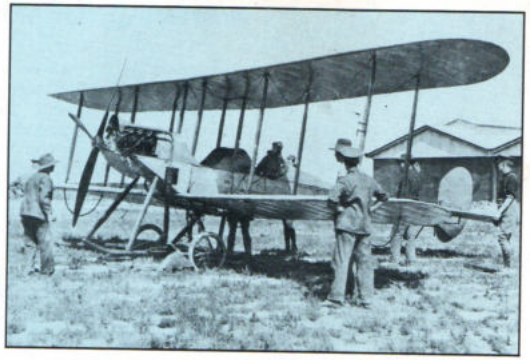
Qantas also went to war. Its skilled long-distance flying boat crews took delivery of Catalinas from the US for the RAAF, making the Pacific crossing virtually routine. In Papua New Guinea, Qantas civilian crews were among the "biscuit-bombers" that supplied the troops. But the epic of all aviation epics was the long flight from Perth to Colombo, which kept open air links with Britain throughout the Japanese push into the Pacific. The slow Catalinas were in the air for up to 30 hours, their few priority passengers awarded "the order of the double sunrise" because they would see two dawns.

After the war, a flood of trained pilots returned to civilian life. With them came a new appreciation of what aviation could do, within Australia and linking Australia to the outside world. The Australian government set up what was then Trans-Australia Airlines (now Australian Airlines) and tried to put ANA out of business. It also bought the private shares in Qantas and made it a government-owned corporation, which it remains today.

Australian National Airlines, however, wilted under the competition from the vigorous TAA on one hand and the nibbling of Ansett on the other. After making disastrous aircraft selections, it went out of business and Ansett bought it. To provide a secure foundation for domestic airlines, the government introduced the two-airline policy, which controlled the market. In the two decades since, the domestic airlines have used their privileges wisely, buying modern equipment and establishing a national network.

Given an overseas monopoly, and with new responsibilities created by the mass migration to Australia in the post-war years, Qantas also maintained a world leadership in safety, operations and service. It was the first non-US carrier to buy Boeing jets, and before that, the first round-the-world carrier. It was more cautious in acquiring Boeing 747s, but the policy paid off when Qantas became one of the first airlines to introduce the improved 747-200 model.

At Richmond, visitors are able to see many facets of this history. It's been about 75 years since Hart selected Ham Common and frightened the nearby cows to establish what is now Richmond. Look around, and realise the history behind what we see today.



The AFC's first instructor, Capt Eric Harrison, prepares to fly, below; from left, rookie pilots in 1914, BE2A trainer, and more ambitious pilots, 1916

An Eye on the Air

The RAAF has played a vital role in an unprecedented era of air and space development. By Frank Doak

The Royal Australian Air Force (RAAF), one of the oldest air forces in the world, was formed in 1921, just three years after the formation of Britain's Royal Air Force (RAF).

Australia's involvement in military aviation goes back much further, however — to 1911, when the government called for applications from "two competent machinists and aviators" to form a flying corps for the Army. This led to the formation in 1914 of the Central Flying School, Werribee, on a 297ha former grazing property at Point Cook, 26km southwest of Melbourne on the shores of Port Phillip Bay. The two flying instructors were Captain Henry Petre, an Englishman, and Lieutenant Eric Harrison, from Castlemaine, Victoria, who had been working as a pilot in England.

Four operational squadrons were formed at Point Cook for the Australian Flying Corps (AFC) during the First World War: No. 1 Squadron, which served in the Middle East, and Nos. 2, 3 and 4 Squadrons, operating in France. The corps served creditably but paid a high price in young Australian lives — 78 men were killed, 68 wounded and another 33 were taken prisoner.

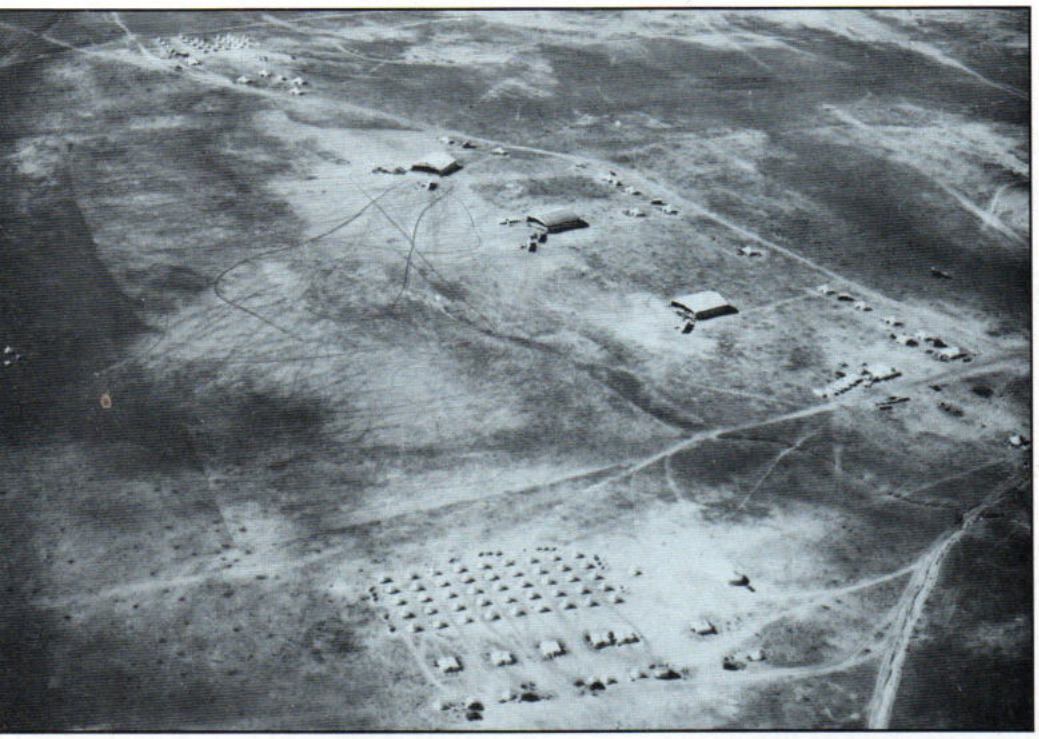
After WWI, the AFC ceased to exist as a flying unit and was disbanded on the formation of the Australian Air Force on March 31, 1921 (the prefix "Royal" was authorised by King George V later that year). However, many of the founders of the RAAF had served in the AFC, including Lt-Col. Richard Williams DSO, who had commanded No. 1 Squadron with distinction during the war. Williams was appointed the first chief of the air staff with the rank of wing commander, at only 30 years of age.

Point Cook was Australia's only military airfield in 1921 and the RAAF's strength was just 21 officers and 130 other ranks. But it certainly did not lack for aircraft, because Britain, grateful for Australia's wartime effort, had presented Australia with 128 aircraft, plus spare engines, tools and motor transport. This gift, added to the 42 aircraft already at Point Cook, meant that for a time the RAAF was in the unique position of having more aircraft than men.

Pilot training resumed in January 1923, and new stations were established at Laverton (near Point Cook) and Richmond (Ham Common), west of Sydney. In 1935, new aircraft entered service — 18 Hawker Demon fighters and 24 Supermarine Seagull V amphibians, followed by Avro Ansons. The creation of 19 squadrons for home defence had been approved in principle. A much-needed morale booster occurred in 1938, when the government placed an order for 50 Lockheed Hudson bombers from the United States. These, the first American-built aircraft in the RAAF inventory, were delivered in 1940. They could not have arrived at a more critical time — the Australian-designed and built Wirraway "fighter" aircraft was also entering service.

In 1939, the British and Australian governments agreed to build British Beauforts in Australia, for both the RAF and RAAF. The twin-engined bombers were built in Melbourne and Sydney, while in Sydney the De Havilland company built Tiger Moths for elementary pilot training from 1939.

At the outbreak of the Second World War in September 1939, the RAAF had 246 aircraft — 82 Avro Ansons, 54 Hawker Demons, seven CAC Wirra-



Nestled beside the trim lines of an infantry regiment, Australian fighter base in Palestine, 1918, at top; pilot, below, and RE-8s and BE-2s of 1 Squadron in the desert

ways, 21 Supermarine Seagulls and 82 trainers — only 64 of them classified as operational aircraft. A detachment of No. 10 Squadron were in England to take delivery of Short Sunderland flying boats for Australian coastal reconnaissance when Britain declared war on Germany on September 3, 1939. Australia immediately offered the squadron's service to the RAF, and No. 10 Squadron remained in the United Kingdom for the duration of the war, operating with Coastal Command. It was the first Dominion squadron to go into action against Germany.

The RAAF had truly come of age for its 21st birthday during WWII. At the height of the war, it had expanded to a strength of 20,000 officers, 144,000 airmen and 18,000 airwomen and nurses. There were 3037 operational aircraft and 2808 trainers, with RAAF men serving in every theatre of operation.

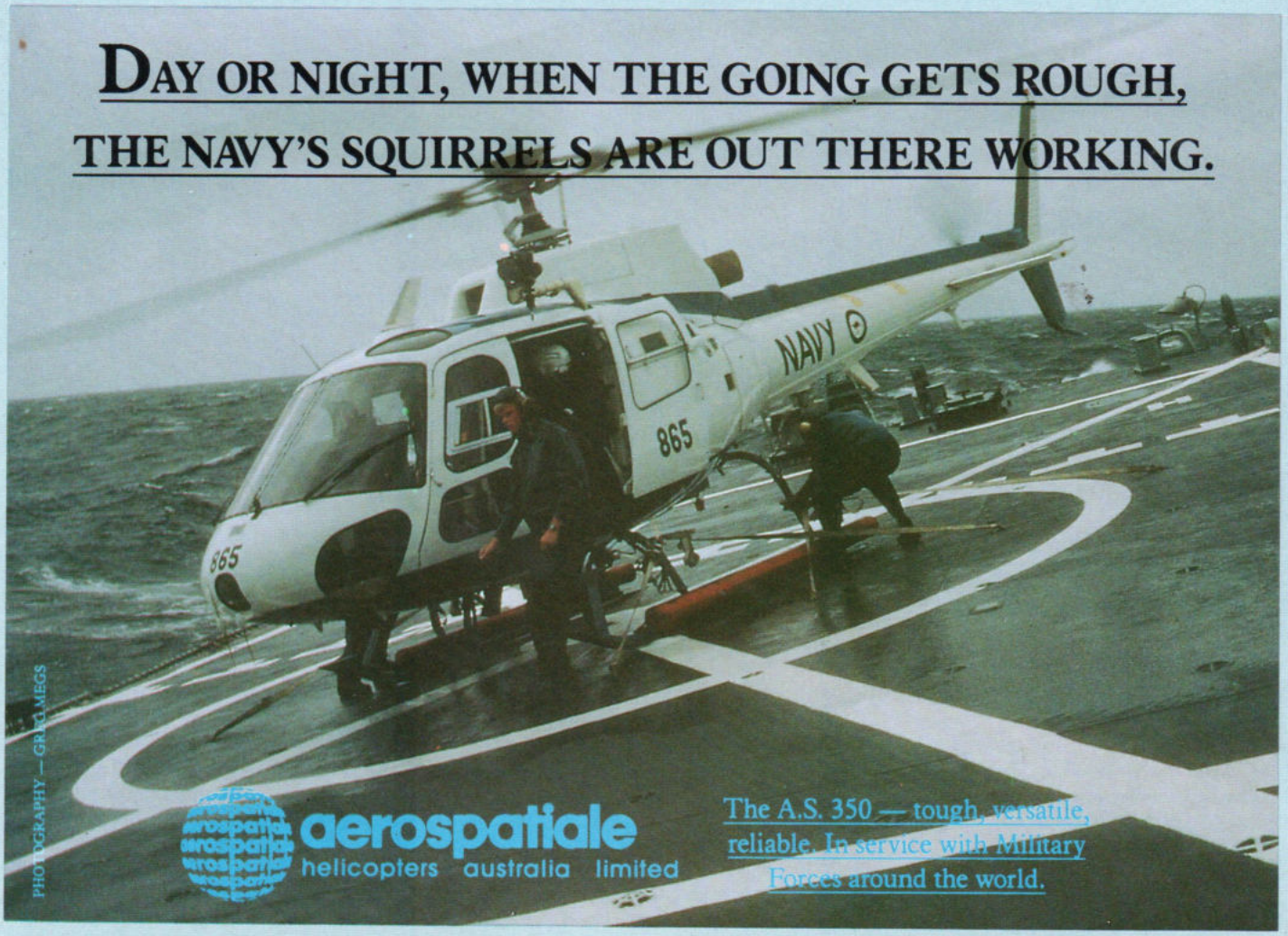
Compared with the might of the German Air Force, military strategists in Britain soon recognised the RAF's shortcomings and the inadequacies of the air forces of the Commonwealth countries. Thousands of planes needed to be built and hundreds of thousands of aircrew had to be trained. Clearly, a gigantic effort was needed. The solution was the establishment of the Empire Air Training School (EATS). The E-A-T-S, as it was commonly known, was designed to provide almost 50,000 trained aircrew — 22,000 from Britain, 13,000 from Canada, 11,000 from Australia and 3300 from New Zealand — each year, for as long as the need continued. Training on such a scale could not be handled in Britain alone, with its frequent bad weather and congestion of airfields, so it was agreed to train the majority of the men in Canada, Australia, New Zealand and Rhodesia. On completion of their training, aircrew were to join RAF squadrons or Dominion squadrons under RAF operational control in England. Members of the RAAF were to wear their own distinctive dark blue uniforms and to receive Australian rates of pay.

The RAAF accepted a training commitment of 923 aircrew each four weeks, as well as training many thousands of ground staff — an enormous undertaking. To cope, 3061 flying instructors alone had to be trained by the RAAF. The RAAF trained a total of 27,387 aircrew in Australia and provided elementary training for 10,531 pilots, navigators and wireless/air-gunners, who were sent to Canada to finish their training, and nearly 700 initial trainees, who went to Rhodesia for further tuition.

A huge works program was put into effect to establish five aircrew initial training schools, 12 elementary flying training schools, three air navigation schools, two air observer schools, three bombing and gunnery schools, and three wireless/airgunnery schools. The RAAF also formed 12 squadrons in the United Kingdom and five in the Middle East.

The success of the EATS project

DAY OR NIGHT, WHEN THE GOING GETS ROUGH, THE NAVY'S SQUIRRELS ARE OUT THERE WORKING.



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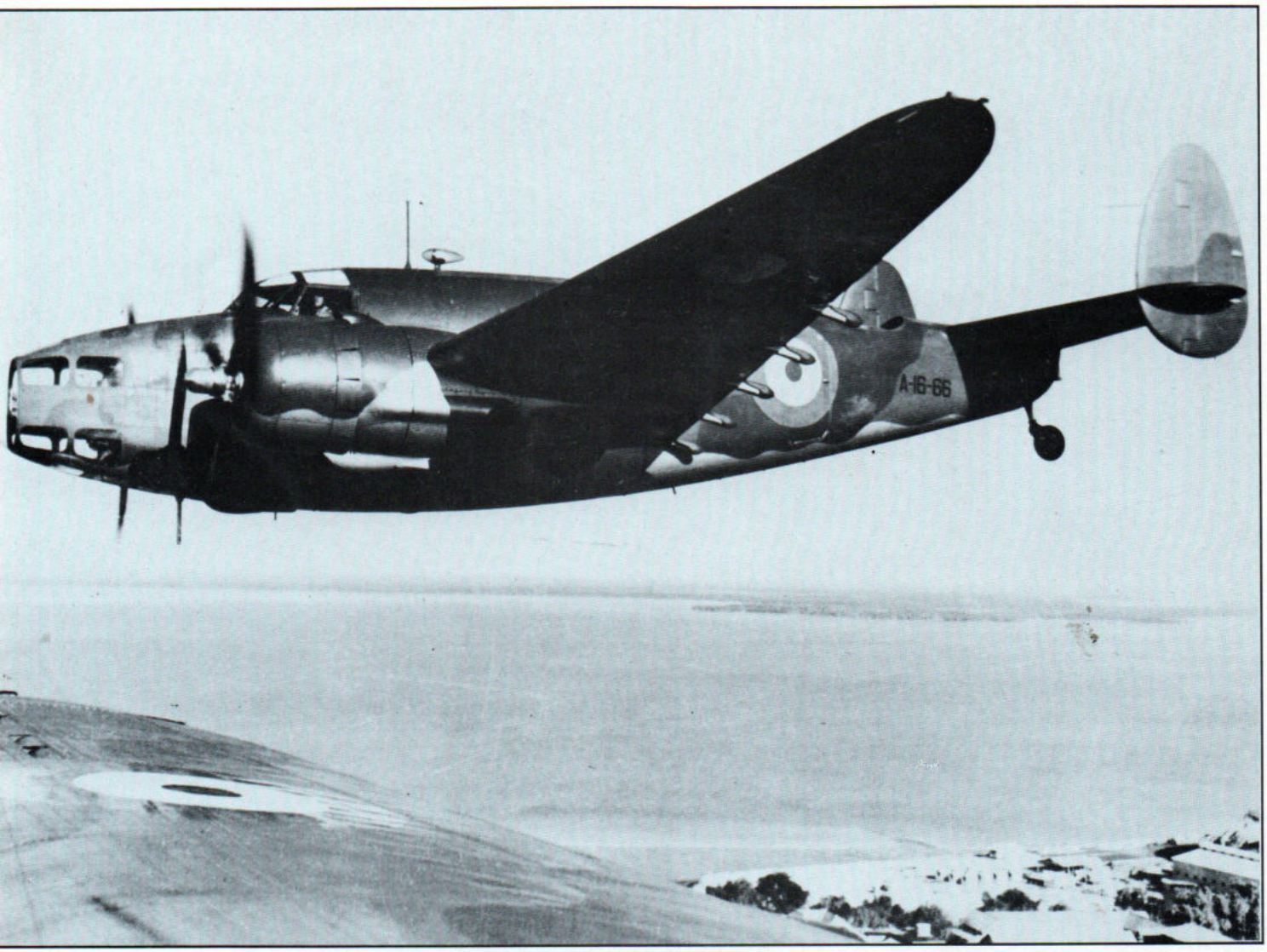

First RAAF aircraft to attack Japanese forces: the Lockheed Hudson, flying with 13 Squadron in Darwin, December 1941

was realised in June 1944, when the British Air Ministry was able to request the cessation of all operational drafts from the Dominions. The balance of air power in Europe then lay heavily on the side of the Allies.

Approximately 15,000 Australians were involved in the air war against Germany and Italy. They flew 31 million air miles on 68,841 sorties, and dropped 65,000 tonnes of bombs. RAAF men destroyed or damaged 109 enemy aircraft and probably destroyed or damaged a further 238; they sank 35 enemy ships and submarines and probably destroyed or damaged a further 206 vessels. In all, 6636 RAAF men died in action — one-fifth of the total Australian war deaths in all services and campaigns of the war.

Perhaps the part played by the RAAF in the Pacific and Far East was more familiar to Australians, as it was closer to home. Four RAAF squadrons based in Malaya — Nos. 1 and 8 squadrons equipped with Lockheed Hudsons and Nos. 453 and 21 Squadrons equipped with Brewster Buffalo fighters — were among the first of the Allied units in action in the war against Japan. In fact, No. 1 Squadron, based at Kota Bharu on the east coast of Malaya, was the first unit of the Allied air forces to strike at the enemy during the Japanese invasion of the Malay Peninsula in the early hours of December 8, 1941. The four Australian squadrons fought against overwhelming odds and eventually were forced south to Singapore after heavy losses. From there, the remnants of the RAAF squadrons withdrew to Sumatra, Java and some to Australia, but most of the aircrew were either killed or taken prisoner. In March 1942, following the fall of Singapore and Britain's surrender of 60,000 troops, including Australia's 8th Division, the Australian government approved a plan to expand the RAAF to 72 squadrons — more than double the 1939 plan setting 32 squadrons as the RAAF's wartime requirement.

The Japanese advance was relentless, sweeping like a tidal wave through the Philippines, Indonesia, the Celebes, the Solomons, and capturing the naval base at Rabaul. On February 19, 1942, for the first time in history, enemy bombs landed on Australian soil when Japanese carrier-borne aircraft made two heavy raids on Darwin, the first of 64 air raids on that city and its environs over the next 21 months. American Curtiss Kittyhawk fighters of the United States Army Air Corps were staging through Darwin when the first raid took place, and the pilots went into action, shooting down two Zeros. Eventually, however, all the Kittyhawks were destroyed.

The first glimmer of hope came on March 22, 1942, when RAAF Kittyhawks of No. 75 Squadron operating from Port Moresby, New Guinea, attacked the Japanese-occupied Lae airfield and destroyed 12 aircraft, damaging another five. As the war in the Pacific developed, with American forces

pouring in men and equipment, the Japanese advance was gradually brought to a halt. The RAAF's squadrons were being re-equipped with modern American and British aircraft and, operating from northern Australian and island airstrips, pressed home attack after attack. RAAF Consolidated Catalina aircraft mined Japanese-occupied harbours as far afield as Hong Kong. Slowly at first, but gathering momentum as the months went by, the all-powerful American war machine under the Supreme Allied Commander, General Douglas MacArthur, forced the enemy to retreat. Then suddenly, the war was over, brought to an abrupt end with the atomic bombing by American aircraft of Hiroshima on August 6, 1945, and Nagasaki on August 9.

Total RAAF enlistments during WWII were 189,000 men and 27,200 women (members of the Women's Auxiliary Australian Air Force and the RAAF Nursing Service). RAAF casualties totalled more than 13,000, including more than 11,000 dead. Of this total, nearly 4000 died in the war against Japan. Since then, the RAAF has been involved in minor and major conflicts — the Berlin Airlift, Korea, the Malayan Emergency, garrison duty in Malta, and in Vietnam.

Ten RAAF crews travelled to Germany in 1948-49 to fly Douglas Dakota transports in the Berlin Airlift that broke the Russian blockade of the city, and between 1950 and 1958, the RAAF operated GAF Lincoln bombers of No. 1 Squadron against communist terrorists in Malaya. The RAAF operated No. 77 Squadron, equipped with North American Mustang fighters and, later, Gloster Meteor 8 jets, during the Korean War from June 1950. The squadron was used mainly in a ground attack role, but six enemy aircraft were also shot down. In three years, the RAAF lost 41 members, as well as a number of RAF pilots on duty with the squadron. RAAF Dakotas carried out most of the aerial supply and medical evacuation for the Commonwealth Forces in Korea.

Between 1952 and 1955, the RAAF's No. 78 Fighter Wing operated RAF De Havilland Vampire jets from Malta on garrison duty. Three squadrons were committed to the war in Vietnam. Transport Support Flight (later renamed No. 35 Squadron) operated DHC Caribou transports from the US Army base at Vung Tau from August 1964 to February 1972, carrying passengers, freight and mail. Bell Iroquois helicopters of the RAAF's No. 9 Squadron also operated from Vung Tau, from June 1966 until December 1971, supporting the 1st Australian Task Force based at Nui Dat in Phuoc Tuy province. The squadron was involved in all major operations mounted by the Task Force, deploying and re-supplying troops and evacuating casualties. GAF Canberra bombers of No. 2 Squadron operated from Phan Rang air base under the United States Air Force operational control between April 1967 and June 1971. And from 1958 until earlier this year, the RAAF maintained units at Butterworth air base in Malaysia.

The Department of Defence in Canberra, which includes Air Force Office, is the centre from which control is exercised over the armed forces. The Chief of the Air Staff, as commander of the Air Force, is responsible to the Minister for Defence through the Secretary of the Defence Department and the Chief of the Defence Force Staff for its control, operations, management, organisation and administration. The Chief of the Air Staff administers and controls the Air Force through two functional commands — Operational Command and Support Command. Operational Command, with headquarters at Glenbrook, New South Wales, is responsible for operational activities and exercises, while Support Command, headquartered in Melbourne, is responsible for air training to "wings" standard, ground training, supply and major maintenance and research and development. The strength of the Permanent Air Force is approximately 22,500, with 4500 men and women in the Reserves.

During its 71 years, the RAAF has won honours as a national air force in major conflicts and has been capable of quick, effective action in smaller engagements. As well, it has given considerable assistance to United Nations peacekeeping forces. The RAAF has taken part in Antarctic research, represented the Australian people during independence celebrations of emerging nations, and assisted America with its space program; it has been very active in the planning and execution of operational exercises with allied forces in South-east Asia, the Pacific and the United States. It readily responds to calls for assistance during civil emergencies — following natural disasters at home and abroad, emergency medical evacuations, searches for people lost on land and sea, and help during times of flood and bush fire.

The RAAF is a proud service. It has a history of endeavour and sacrifice which has won it a place in the hearts of all Australians and respect among the defence forces of Australia's allies.

On patrol: Hudsons of 23 Squadron at top; and Kittyhawks of 76 Squadron. The Hudson nearest to us was shot down in 1942

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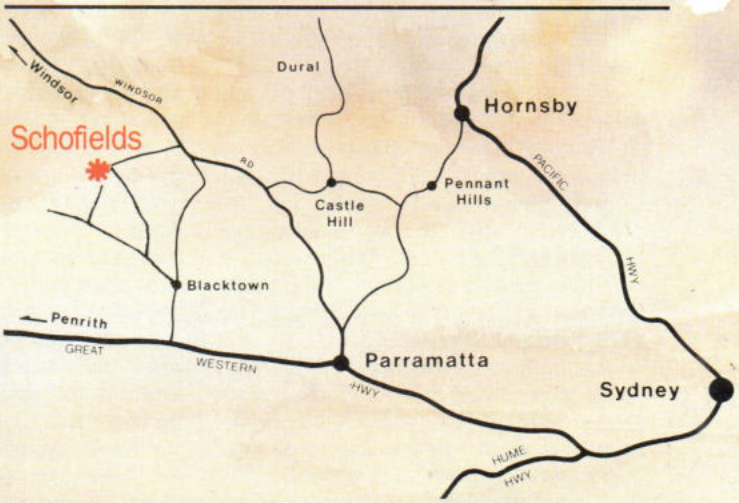

Schofields Flying Club

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Don Stephens '88

On the Wings of Enthusiasm

Small-scale air shows paved the way for the big one in '88. Stewart Wilson traces its humble beginnings

To the average person visiting this Bicentennial Air Show at RAAF Base Richmond, the depth of organisation that goes into an event of such magnitude may probably mean very little. He or she may marvel at the number and variety of aircraft on display, will be amazed at the multitude of companies and organisations displaying their wares in the Aerospace Expo, and will most likely spare not a thought for how it all came about.

Several hundred thousand people will visit Richmond for the Bicentennial Air Show, the largest such event to be held anywhere outside Europe and the United States. Everywhere, the impression of "big" is the obvious one, but the origins of this major event in Australia's 200th year are considerably smaller . . . so small in fact as to be almost anonymous.

If asked about the Schofields Flying Club, very few of this Air Show's visitors would be able to offer any comment, let alone realise that organisation's considerable involvement in the Air Show, the end result of an evolutionary process which began a dozen years ago and culminates this October at Richmond. In fact, it would probably not be too great an exaggeration to suggest that without the Schofields Flying Club there would not be an Australian Bicentennial Air Show — or at least not one of this quality.

Schofields is an aerodrome located just a few kilometres from Richmond, on government land used by the Navy under the name HMAS Nirimba. Its Flying Club members are literally "weekend flyers" — as the aerodrome is situated within the Richmond Control Zone, operations are restricted to Saturdays and Sundays. The club operates some 12 aircraft and its membership stands at around 350, but just 12 years ago it was substantially smaller.

In 1976, Schofields Flying Club had 60 members, with enthusiasm by the truckload but no aircraft to call its own, and no readily available cash with which to purchase one. The brave decision was taken to hold an air show at Schofields, hopefully to raise enough money to buy an aircraft outright, or at least to provide a substantial downpayment on one. At that time, Sydney was starved of air shows, and past experiences with them convinced the organisers that not only did flying displays usually draw a healthy number of aviation enthusiasts but many interested members of the public as well.

The budget for the first Schofields Air Show was set at the princely sum of $10,000, and on September 26, 1976, the gates opened to the public for a show that lasted two hours and comprised mainly light aircraft of many types and vintages. The response was good, with 10,000 people turning up and a profit of $11,000 to show at the end of the day. The Schofields Flying Club's first Piper Warrior aircraft was soon a reality.

That first show had been such a success, it was decided to repeat the

NEVILLE PARNELL

VH-IHU

exercise in 1977. This one was the catalyst that prompted the change from the first informal "get together" to the professional affairs put together over the next few years. The 1977 show witnessed several firsts: the general aviation industry was formally involved, a sponsor — Thorn — was obtained, and the considerably expanded flying display was spread over the best part of two days. Not only light aircraft appeared at Schofields in 1977, but also RAAF planes and one or two examples from Australia's then fledgling Warbirds collection.

More than 300 aircraft were expected for the 1978 (Charles Kingsford Smith Commemorative) show, again held over two days, but many couldn't get through due to very bad weather. The club feared for the success of the show, but despite the need to reorganise the flying display, more than 20,000 people turned up to watch the exciting program that included the RAAF's Roulettes aerobatics team and the Army Red Berets paratroopers.

The weather caused even greater concern in 1979, when cancellation was seriously considered during the exceptionally wet days leading up to the show. But the organisers proceeded with it, and their gamble paid off. More than 200 aircraft of just about every size and shape were on display at Schofields that particular weekend. The show was forced to stop and start as showers came across the aerodrome with annoying monotony. Once again, however, the public backed the organisers' gamble, and 20,000 were there to see a spectacular display.

None of the 20,000 will ever forget one particular part — a British Airways Boeing 747 came down to a height of just 50m above the runway, with everything — flaps, slats and undercarriage — down in the breeze. For many seconds, the sky above Schofields consisted entirely of aluminium, engines and wheels — a remarkable sight.

Show-stoppers at Schofields: clockwise from top, De Havilland Beaver; 12 Squadron Chinook; Caribou; and Lockheed 12A

By 1980, the show had become so big it was proving difficult to organise on an annual basis, remembering that here was one of Australia's smaller flying clubs putting together the biggest air shows the country had ever seen. It was decided to make the show biennial, so the next one wasn't held until 1981. Its duration was extended by a couple of days for the benefit of the aviation trade and the press.

And what a show it was. Built around the RAAF's Diamond Jubilee, the Service turned out most of the aircraft in its inventory, and the 50,000-plus spectators witnessed flying displays by Mirages, F-111s, Orions, Hercules, Caribous, Chinooks and a restored Avon-Sabre. Supporting that was a cast of thousands of aircraft, ranging from ultra-lights to Tiger Moths through to Warbirds, executive jets and hot air balloons. Even the guest of honour, the late Sir Douglas "Tin Legs" Bader, was immensely impressed.

Glorious weather in 1981 may have created a false sense of security, because come the 1983 show, Mother Nature served her revenge. Even the first of the two public days, Saturday, was held in good weather, and tens of thousands of spectators poured through the gates. But on the second day, the severe drought from which Australia had been suffering decided to break with a vengeance. Aviation enthusiasts from all around Australia braved the weather to attend and see the show's guest of honour, Chuck Yeager, the first man to break the sound barrier.

Strangely, the solid and low cloud cover provided one of the highlights of the show. The United States Air Force had flown a Boeing B-52 bomber direct from Guam to perform a couple of flypasts. With Schofields completely obscured by cloud, the B-52's crew had great difficulty in finding its destination. It flew around for a while with its sound clearly audible from the ground and occasionally, a wing tip or tail fin would appear through the cloud as the B-52 delicately descended. Suddenly, there it was, like a monster emerging from the mist. A big, black B-52, seemingly just metres above the ground.

The last Schofields Air Show held at the aerodrome was in 1985, when once again a large and varied program drew tens of thousands of spectators. Even the weather was kind this time. Having been commissioned by the Australian Bicentennial Authority to run the Australian Bicentennial Air Show in 1988, the club used Schofields '85 as a test run for the "big one" in 1988.

Astronaut Pete Conrad was the special guest, and the RAAF's new F/A-18 Hornet was on display in Sydney for the first time. The Hornet's "super-slow" flypast stole the show when it was overtaken by a replica World War I Sopwith Pup.

Considering the way it began, it's staggering to think that this show at Richmond has its origins in 30 members of a far from wealthy flying club. And it is those members and the ones who followed who are responsible for the show's growth over the years and its culmination in the 1988 Air Show.

NEVILLE PARNELL; DON STEPHENS

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Willi Schurter
Vice President, Engineering & Maintenance
Swissair

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Richmond Hercules crew over Canada during Exercise Bullseye '88 at top; a 36 Squadron "Herc" dropping paratroopers, below left; and a 38 Squadron Caribou going skiing, at right

Getting off the Ground

Ron Elliott revisits the site for the Air Show — an aerodrome that holds pride of place as the RAAF's "home of the heavies"

I have just travelled down from the Blue Mountains through heavy mist to the RAAF Base Richmond. As I speed along the road parallel to the base's perimeter fence, aircraft can be seen preening in the early morning sun . . . each one costing perhaps as much as the total land cost for the base.

Long fuselages of the Boeing 707s of 33 Squadron boast quietly of fast efficiency, their swift wings ready to carry aloft passengers and cargo to all corners of the world. Soon, a number of these thoroughbreds will be converted into tankers to provide aerial bowsers for the thirsty F/A-18 Hornet aircraft that control our vital air space. In the process, long range will become the norm as the F/A-18s, swift messengers of deadly intent, increase their areas of effectiveness.

Further along the tarmac, heavy-duty Lockheed C-130 Hercules wait impatiently for cargoes that will be delivered with total reliability to destinations both great and insignificant within and outside Australia. These proud workhorses have been the backbone of the RAAF for 30 years and in that time, a fine history of achievements has been built around them, matched only by the ubiquitous Dakota.

The snub-nosed Caribous appear as ungainly creatures, but their looks are most deceptive. Once in the air, these noisy and slow-moving short take-off and landing aircraft come into their own as flying trucks that can operate from unprepared dirt and grass strips with minimum fuss and maximum efficiency. Further along the flight line, the large T-tail of the giant Lockheed C-141 Starlifter of Military Airlift Command informs of the presence of the USAF "heavy heavies", with their rapid equipment and personnel deployment capabilities.

The early morning setting seems a world away from the days when this area was known as Ham Common. Then, cows grazed here and local farmers kept up a running feud with authorities, who felt that cows and aircraft simply did not have equal importance for the contested land. This was a time when the Sydney Technical College started its pioneering flying program, when a dentist named Billy Hart imprinted his name on the earliest of aviation records and when flying was regarded not only as dangerous but downright foolhardy.

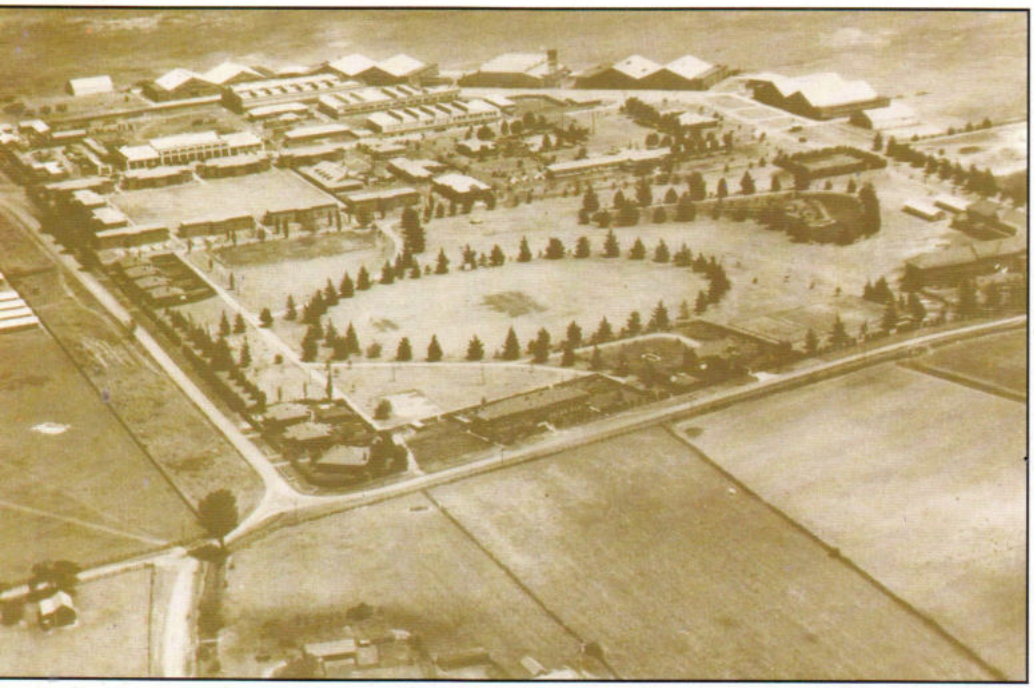
The guard on the main gate welcomes this bush parson into the domain of RAAF Richmond. With courtesies exchanged, I motor toward the chaplain's department. A special message on the base signboard announces: "Congratulations 36 SQN on 1st and 3rd . . . Exercise Bullseye, Canada." All around me, I sense the satisfaction of this most recent award, won at Trenton in Ontario, Canada, against stiff competition from New Zealand and Canada. Yet, this distinction is nothing new — only weeks before, RAAF Base Richmond had been awarded the prestigious Hawker Siddeley Trophy for the most efficient RAAF Base, and one of the units, No. 38 SQN, recently was awarded the Gloucester Cup, as the most efficient operational squadron in the RAAF. The squadron had received this trophy on four previous occasions.

Flying the flag: C-130 Hercules crew after winning first and third places in Bullseye '88

Ever since its establishment in 1925, the base has promoted the pursuit of excellence in all its roles, no matter how difficult the circumstances. No. 2 Aircraft Depot was quickly established, providing necessary engineering support functions. In the 1930s, further development took place as the world began to prepare for war. During the Second World War, a number of squadrons were accommodated, many of them later winning battle honours in numerous theatres of war. With the cessation of hostilities, RAAF Richmond settled down to its peacetime role. Dakotas of No. 86 Transport Wing held high the RAAF flying traditions, but soon further expansion began in the light of the Korean War.

The arrival of a brand new "baby" — the Lockheed C-130A Hercules — heralded a new era of efficiency and capability. Here at last was equipment equal to the best in the world, and 36 Squadron rose to the occasion. Squadron 37 followed in the same footsteps in 1966, with the receipt of 12 E model Hercules. In 1978, A models were replaced by brand new H model Hercules, allowing 36 Squadron great flexibility in operational flying.

The re-equipment of these squad-



A self-contained community: RAAF Base Richmond in 1941, above; and below, in 1921; at right, aviator Amy Johnson is greeted by the base commander during WWI

rons was the beginning of a 30-year association with these aircraft types, which was given tribute on August 19 and 20, 1988. Aircrew and groundcrew and all those who had some contact with the "Herc" gathered with 36 and 37 Squadrons at Richmond to celebrate 30 years of major accident-free flying with a very faithful workhorse.

There are many facets to RAAF Richmond's proud history, but none more dramatic than the ferrying back of wounded service personnel from the Vietnam conflict. The long hauls were to allow for in-flight medical assistance, and there were many grateful recipients who quietly offered a prayer to pilot and nurse for their dedication. This expertise would later be applied to medevacs, where seriously injured civilians or service personnel would be transported back to Australia from other locations for urgent medical attention. One pioneer who formulated a system of medical procedures in the medical evacuation role is Dr Paul Degotardi, and the experience gained has been adapted by other fields of medicine. No. 3 RAAF Hospital at Richmond has displayed the highest standards of dedication and professionalism in this most demanding role.

No incident has had the emotional impact of Cyclone Tracy, when Darwin was almost wiped off the face of the earth in a terrifying ordeal of wind and rain on Christmas Eve, 1974. In spite of the huge devastation, the "Hercs", crewed by pilots, navigators, flight engineers and loadmasters, worked around the clock, rescuing survivors and ferrying desperately needed food and medical essentials to Darwin.

Many a country town has had cause to thank these angels on the wing as tonnes of fodder have been dropped to stranded stock during floods. These fodder drops have brought relief to worried farmers and graziers and preservation of life to endangered livestock. Overseas, a number of nations also have had reason to give thanks for the effectiveness of Richmond's aircraft in times of national disasters.

To keep the aircraft airworthy, 486 Squadron fulfils an essential maintenance role. Long hours, often under the most arduous of conditions, have guaranteed that vital aircraft performances are maintained. Not only are the airframes and engines thoroughly overhauled, but the various sophisticated aircraft instruments and radios are skillfully serviced to enable aircraft to undertake their critical roles both within and outside Australia.

So, when a sign is erected in tribute to 36 Squadron's achievements overseas, behind its simple message lies acknowledgement of the contribution by the 2500 service men and women at Richmond that has allowed the base to hold pride of place as "the home of the heavies".

The catering staff, airfield guards, mess staff, air movements section, Base Support Wing with its administrative functions, the Housing Section and Base Transit Post, the Movements Co-ordination Centre — all can share in the sense of achievement engendered by 36 Squadron's triumph in Canada.

As I drive away from the base on Friday, August 12, the oldest dual-seat Mirage still flying is undertaking a series of touch and goes along the broad bitumen of the runway. This delta wing machine, A3-101, from an age before

the F/A-18 Hornet, roars its presence across the base and countryside. Motorists have stopped to watch the aerial gymnastics of this unexpected visitor, which seems to be declaring that the sky is its sole domain.

Yet, somehow, as I look across to the flight line of "Hercs", Caribous and 707s standing to attention, I sense that they aren't really fazed by this pesky intruder. They mightn't have the classic speed lines nor possess the showmanship of the aerial greyhound, but they will be around for a long time.

It feels appropriate that the Australian Bicentennial Air Show be held at this establishment. I think the ghosts of Sir Charles Kingsford Smith, who undertook a number of his famous flights from this base, and Amy Johnson, who also flew her aircraft onto its soil, would nod in agreement as the yesterdays of memory are reborn and the tomorrows of possibility are faced.

"As for the future, our task is not to foresee, but to enable it."

Antoine de Saint-Éxupéry

The Federal Airports Corporation is proud to be associated with the Australian Bicentennial Air Show and Aerospace Expo.

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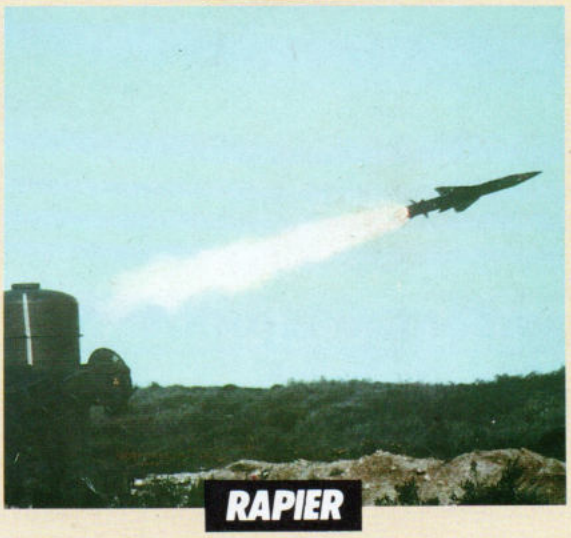


weapons • armament • sensor systems • missiles • ammunition • marine engineering

The Drill

SATURDAY and SUNDAY, OCTOBER 15 and 16

Morning Show

0900

Massed hot air balloon take-off.

1000

RAAF F-111 dump and burn formation.

Qantas — The Spirit of Flight: Boeing 747 display.

F-111 solo handling display.

The Age of Rag-and-Wire — vintage aircraft flypast: Bristol Fighter, De Havilland Dragon, Hornet Moth, Tiger Moth.

Australian-made: Victa Airtourer aerobatics.

Australian-made: Transavia Skyfarmer agricultural aviation display.

The Skydancers: Australian Aerobatic Club Pitts Special formation aerobatic team.

RAAF Caribou handling display.

Gliders synchronised display.

Fighters Old and New: RAAF Mirage and F/A-18 Hornet synchronised display.

Australian Army Aviation Corps: synchronised displays by Bell Kiowa light observation helicopters, and Turbo-Porter and Nomad liaison aircraft.

National Safety Council rescue demonstration: Beech Super King Air, Bell 412, paramedics and pararescue dogs.

Civil helicopter handling display.

USSR helicopter handling display: Kamov Ka-32.

British Aerospace Hawk light fighter solo display.

US Air Force F-15 Eagle air superiority fighter solo display.

Ultralight aircraft demonstrations.

Australian-made: Ultrabat solo aerobatic display.

Military paraparade: RAF Falcons, Australian Army Red Berets, Canadian Forces Skyhawks, RNZAF team.

Lunch Show

1230

Kiwi Red: RNZAF Skyhawk formation aerobatic team.

Zeppelin over London — WWI fighter display: Skyship 600 airship, Fokker Triplane, Sopwith Pup, SE5a.

Jungle Warfare: massed RAAF Iroquois helicopters rappel troops.

WWII/Korea fighter display: Mustang, Fiat G59, Sea Fury, Firefly.

Supporting the Soldier: RAAF Chinook helicopters insert artillery, RAAF F/A-18 Hornets ground attack.

Spitfire solo display.

Mustang solo display.

Vintage anti-submarine aircraft flypast: Ventura, Neptune, Tracker.

Anti-submarine Warfare Today: RAAF P-3C Orion and RAN Sea King helicopter.

International P-3 Orion flypast.

The Start of the Jet Age: Vampire solo display, Sabre solo display.

Air-to-air refuelling demonstration: RNZAF A-4 Skyhawk "buddy" tanker and RAAF F/A-18 Hornet. RAF Tristar strategic tanker and Tornado F.3.

Hero of the Falklands: Royal Navy Sea Harrier solo display.

RAAF P-3C Orion solo display.

RAF Tornado F.3 solo display.

Australian Airlines A300 Airbus handling display.

The World's Largest Aircraft: USSR Antonov An-124 Ruslan handling display.

RAAF F/A-18 Hornet solo display.

Homebuilt aircraft demonstrations.

Afternoon Show

1500

The Roulettes: RAAF Macchi MB326 formation aerobatic team.

Ansett flypast: Boeing 737 and 727, BAe146.

Australia's Most Famous Aeroplane — Southern Cross replica flypast.

Military trainer flypast: Harvard, Wirraway, Winjeel, T-28B Trojan.

The World's Most Famous Aeroplane — DC-3 flypast.

USSR Sukhoi Su-26M solo aerobatic display.

Today's Pilot Trainer: RAAF Pilatus PC9.

Siai-Marchetti S.211 jet trainer solo display.

Bizarre Ritual: mating dance of the Chinook!

Battlefield helicopter: Australia's new Black Hawk helicopter.

Australian-made: Royal Flying Doctor Service Nomad demonstration.

RAAF C-130H Hercules handling display.

RAF Nimrod handling display.

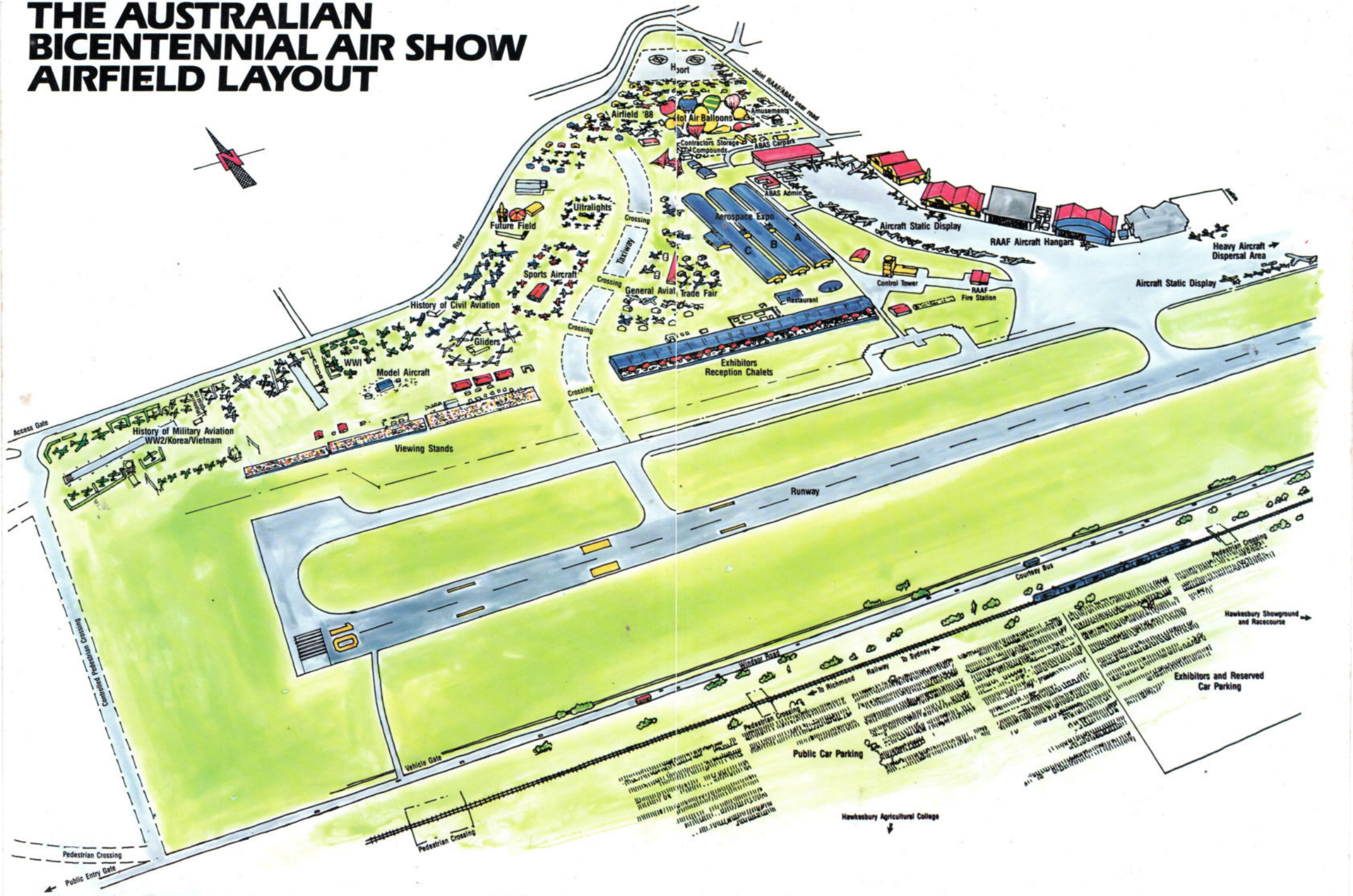
The Skyblazers: Australia's Unlimited class aerobatic champion, Ghris Sperou. Synchronised aerobatics.

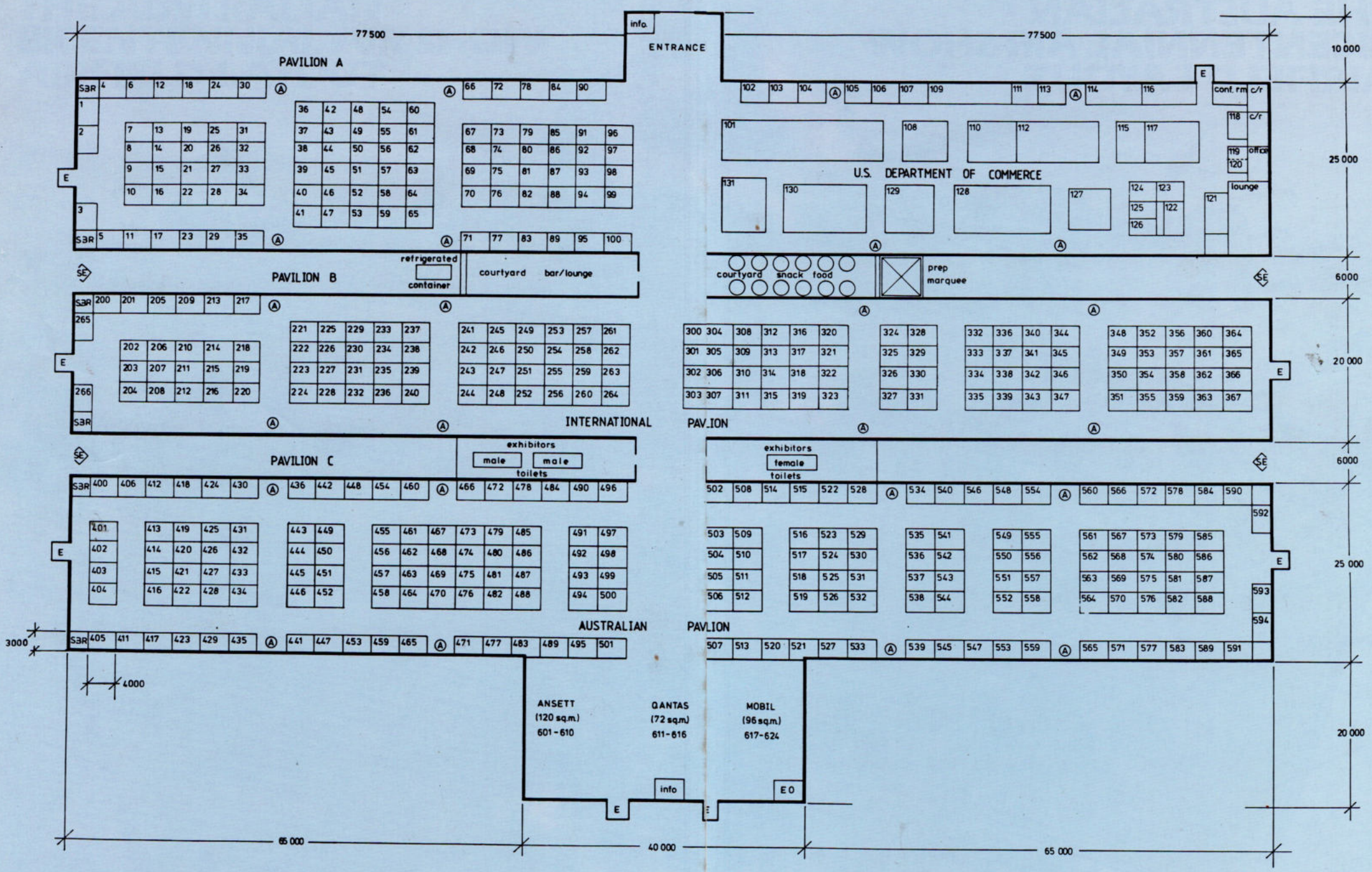
The French Lady: RAAF Mirage solo display.

Dump and Burn: RAAF F-111 formation in a spectacular finale.

(All flying programs may be subject to change without notice for operational or other reasons. Weather conditions may also cause substantial changes to the program.)

THE AUSTRALIAN BICENTENNIAL AIR SHOW AIRFIELD LAYOUT

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info.
ENTRANCE
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PAVILION A
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bar/lounge
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snack
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prep marquee
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cont. rm
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office
lounge
INTERNATIONAL PAVILION
exhibitors
male
male
toilets
exhibitors
female
toilets
PAVILION C
AUSTRALIAN PAVLION
ANSETT
(120 sq.m.)
601-610
QANTAS
(72 sq.m.)
611-616
MOBIL
(96 sq.m.)
617-624
info
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Earning their Wings

For the first time ever, local aviation interests have a world-class venue on Australian soil. Peter Gamble reports

The Aerospace Expo and General Aviation Trade Fair at the Air Show offer visitors a unique opportunity. Rarely is such a broad range of the aviation spectrum offered at a single venue. Also, it provides a unique opportunity for many small companies from Australia and Asia to exhibit; they certainly could not afford to do so at other international venues.

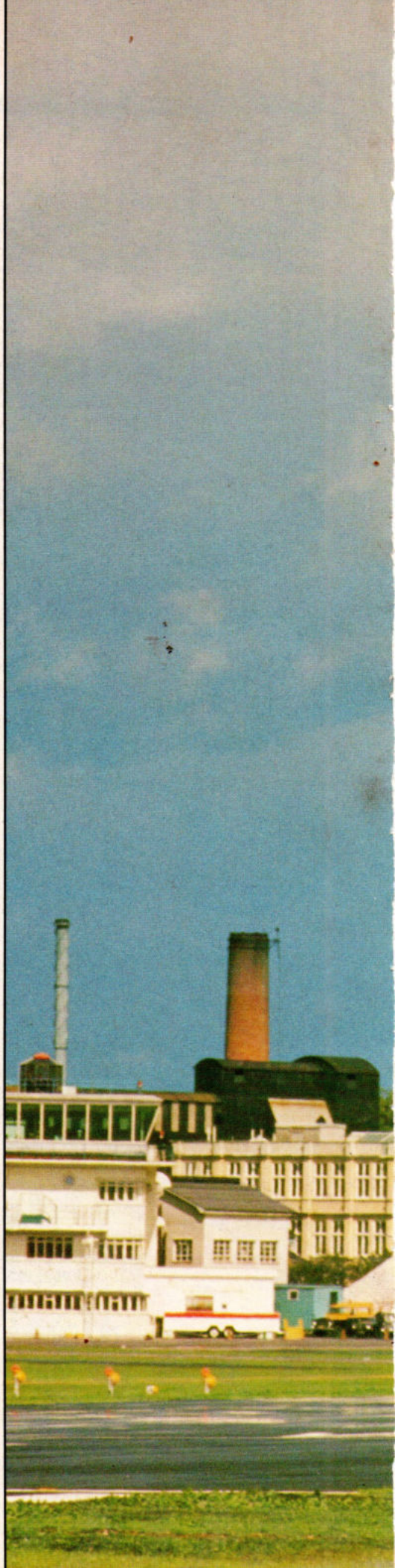
To the uninitiated, the world of aviation might simply conjure up images of aircraft that can convey people and commodities through the air. This is in fact true — up to a point. People associated with aviation for any length of time will be slightly more specific — they will inform you that aviation can be broadly divided into two main categories: aerospace and general aviation.

Aerospace is the technology of aviation in the earth's atmosphere and beyond. By its nature, it implies "smart" technology, computer and electronic wizardry; its research and development contributes to rockets, missiles, airliners, military and corporate aviation.

General aviation tends to be that which is associated with secondary airports: air charter of light aircraft, flying schools, crop dusting, aircraft maintenance, leisure flying (such as light aircraft, ultralight aircraft, gliding and ballooning), and the countless ancillary products that support the industry.

The world's great air shows usually cater to particular areas of this spectrum. Paris tends towards the top end — airliners, military aircraft, corporate jets and commuter aircraft, and the associated technology, in short, the essence of the aerospace realm. It's where the "big guns" come to show off. Airliners, tactical fighters, versatile transports, top-of-the-line corporate jets and commuter aircraft are put through their paces, partly to thrill, ultimately to write business.

Oshkosh leans towards the general aviation industry. Every conceivable product to do with that end of the spectrum can be seen there. All the tried and tested piston-propeller aircraft are always on show there; as well, the visitor will see odd variants of them, models that have been converted to turbo-props, models that have had their fuselages lengthened, or tail-wheelers changed to nose-wheelers. Unusual experimental aircraft abound — canard shapes, composite material aircraft, and some models that somehow seem to defy gravity.



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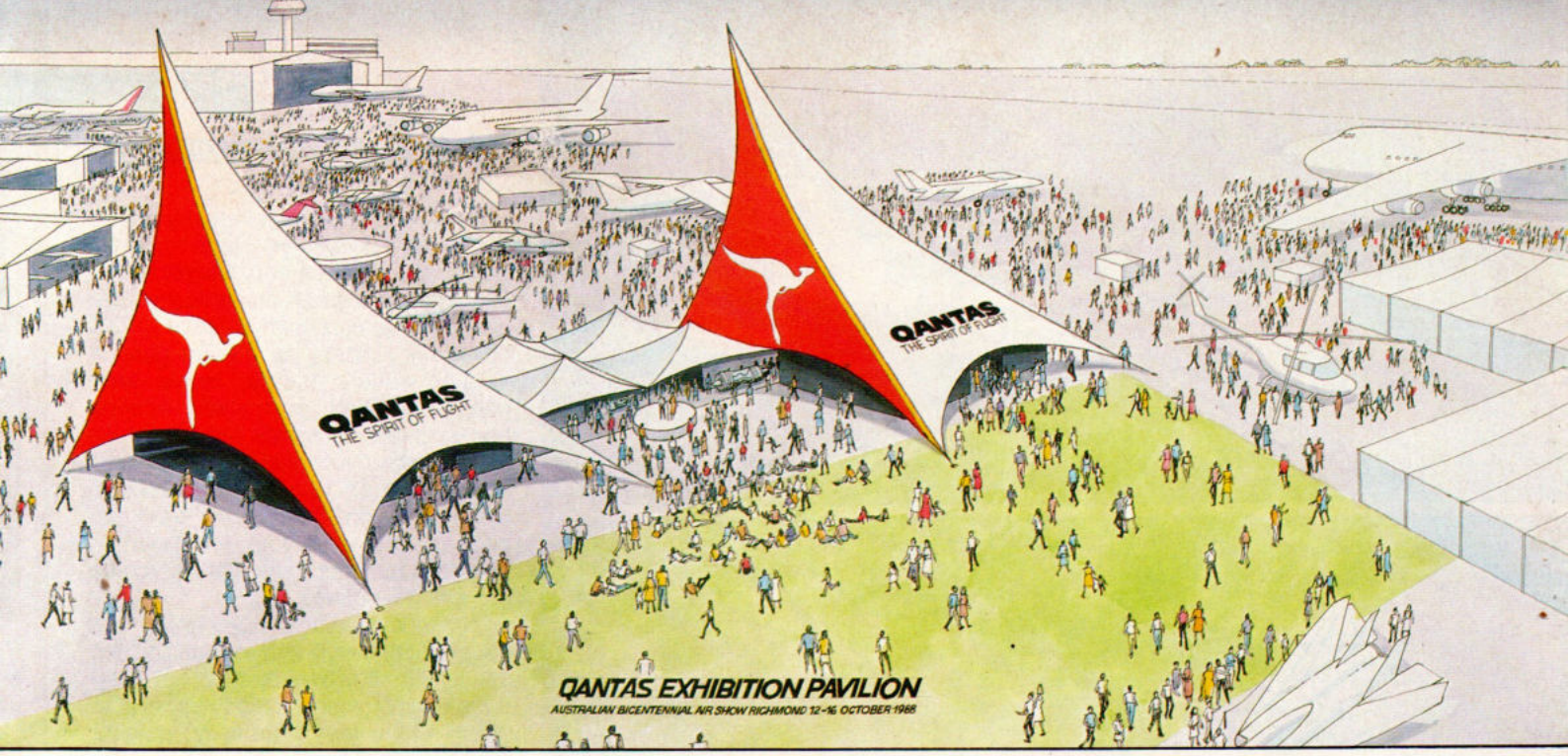


The soaring sails of Qantas' startling exhibition pavilion

Farnborough probably offers the broadest range, but even then, Britain usually stages separate events for its military tattoos and the like.

The Australian Bicentennial Air Show guarantees the lot! It is precisely because of this that the Air Show has attracted the same patronage as would be present at the other international venues. The attendance list contains practically all of the internationally recognised names in the aerospace field, from manufacturers of the aircraft through to the companies that produce the paint that goes on them.

A lot of business between aerospace companies is pre-empted, if not written, at major air shows. Also, there is an enormous exchange of information. To the general public, many of the exhibitions many leave them unmoved, due to the esoteric nature of some products, such as a new type of seal for the nosewheel of a military fighter. To a trained eye, however, that seal might represent several hundred more trouble-free flying hours. It's business.

This is the reason why three days, October 12-14, have been devoted exclusively to trade days. Make no mistake, this is when delegates, collectively representing amounts of money exceeding Australia's Gross National Product, will be seeking short- and long-term contracts.

But why come all the way to Australia to do this? There are two very valid reasons: first, the amount of money that Australia spends in aviation; and second, the influence Australia's decisions have on its neighbours in the Pacific basin, and on Asian countries.

Australia is held in high regard in the aviation world; it has grown up with aviation and figured prominently in its early development. It is the third largest purchaser of military aircraft, the second largest buyer of airliners, and the largest consumer of general aviation aircraft. Australia is one of the US aerospace industry's top three export markets, with yearly sales around A$1250 million (not including US equipment fitted to aircraft bought elsewhere). Aerospace products are the United States' main export to Australia. Not surprisingly, of the 250 aerospace companies from Australia and 15 other countries, the US is the largest single exhibitor.

It is because of Australia's stature as an aviation-minded country that many aerospace companies are coming. It is well known that Australia has earned a high reputation in operations and safety, both in the civil and the military spheres. This dedicated involvement with aviation has led to advanced research and development in such areas as simulators and aviation electronics (avionics). The new landing guidance system (MLS) to be installed at major international airports in coming years, was originally developed in Australia, for example. Australia also has a reputation for making exhaustive study of new aerospace products before making any purchase. When a decision is ultimately made, there are always very valid reasons for that choice. This process does not go unnoticed, either by Australia's neighbours, or by the competing aerospace companies. The latter ask themselves: why does Australia make the decisions that it does, and just how does it influence its neighbours? As any marketeer would reply, go and learn the answers on the market's own turf. This is precisely why the major aerospace companies are here in strength.

Of course, this market strategy is a two-way street. Australia has an aerospace industry of its own, with Austrade co-ordinating an effort to boost the country's aerospace export earnings to more than A$1000 million by the end of this century — which, after all, is only a little more than 11 years away. Austrade is mounting a stand at the Air Show to represent national aerospace involvement, as well as that of the individual states. Victoria leads in this effort; one of its exhibitors, Aerospace Technologies of Australia, builds the RAAF's new F/A-18 Hornet under licence.

The Aerospace Expo will set new standards in Australia for the conduct of an aviation event. Foremost among these is the holding of the indoor section of the Expo within three self-contained air-conditioned pavilions to provide facilities similar to those at the Farnborough and Paris air shows. The pavilions are 170m long and 25m wide, modern high-tech temporary structures, with clear-span aluminium roof beams and high grade white PVC roofs and walls. They are fire resistant, storm proof and floored and carpeted. Electric light, power, air conditioning and other services are available, with lavatories, restaurants, and other facilities conveniently located for use by exhibitors and their customers.

An extensive outdoor exhibition area and aircraft static park of 200ha has been made available, providing facilities for exhibitors to demonstrate their aircraft on the trade days. Single or multiple clear-span reception chalets with a view of the flying display are

Israeli Super Phantom, a re-engined version of the F-4 Phantom, at top; and from the world's largest country, the world's largest aeroplane, the Antonov An-124

available to exhibitors for the reception and entertainment of customers and guests. Each chalet has an internal entertaining area measuring 10m x 15m, and a similar size outside the garden.

The inside section has carpeted timber flooring, white silken walls, a white silken ceiling with chandeliers and air conditioning. The front wall facing the flying display is constructed of clear walling to enable guests to view the flying display from inside the chalet.

The suppliers of the pavilions are specialists in building for temporary events, such as the Australian Grand Prix and Australian Open Tennis. Altogether, the temporary buildings for Aerospace Expo occupy 12,700sqm.

On trade days, the Air Show will be attended by industry professionals, government and military officials, airline, airport and civil aviation executives, diplomatic staffs, international trade associations, and professional organisations from around the world. There will also be a number of delegates (5000 or so) taking part in international conferences to coincide with the event. These include:

- The International Academy of Aviation and Aerospace Medicine.
- International Soaring Symposium.
- Rototech '88 — Helicopter Convention and Exhibition.
- Royal Aeronautical Society — Aerospace '88 Australia.
- The 81st Federation Aeronatique Internationale World Conference.
- The 13th World Assembly of International Aircraft Owners and Pilots Associations.
- Ansett Travel Writers Conference.
- World Conference on International Air Safety Law.
- Aerial Agriculture Association of Australia Conference.
- Australian Defence Procurement Conference.

Large groups from the United States, United Kingdom, Italy and New Zealand will be occupying national pavilions at the Air Show.

The aerospace industry covers an enormous range of products — from communications satellites and aircraft through equipment installed at airports. Some of these products are airframes, avionics, engines, propellers, hydraulics, electronics, laser gyros, computers, navigation systems, fibre optics, advanced composite materials, fuels and lubricants, tyres, tools, simulators, paints and ejection seats — and these are just the tip of the iceberg.

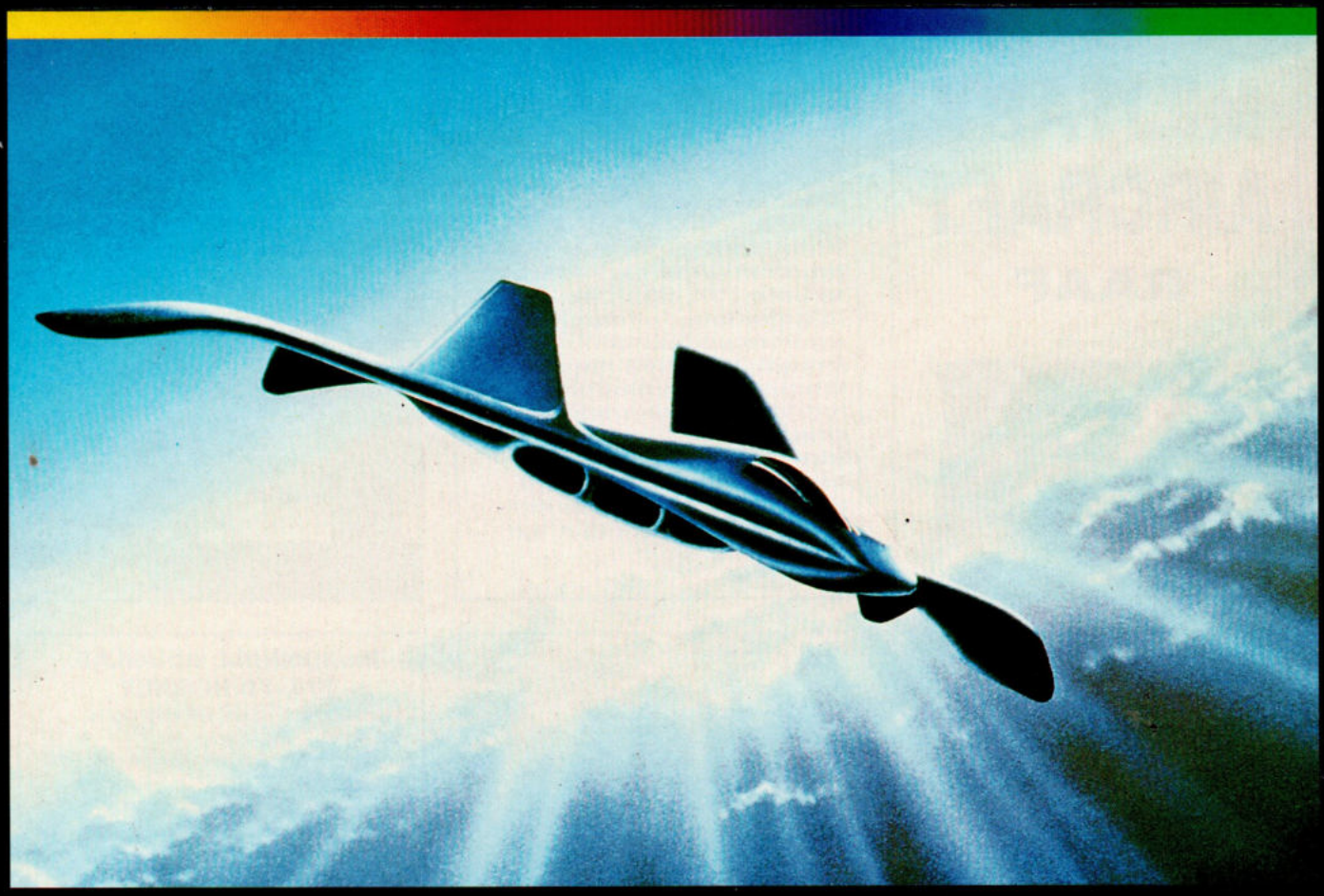
The general aviation industry is also becoming diversified, and, indeed, reaching a level of sophistication that overlaps into the aerospace realm. One grey area is corporate aviation — it's not really airlines, yet it's not general aviation either. Usually, higher level general aviation companies operate and maintain corporate aircraft, which have created a niche for themselves in the past 10-15 years in Australia. Depending on their size, they can offer groups from four to about 16 people fast, comfortable transport on a par with the airlines.

Nowadays, large companies are opting for this style of transport for their executives. It allows them to act independently of airline schedules, and to get to where they want to go quickly. The aircraft offer a similar sophistication to airliners in terms of their navigation equipment, and interior comfort that is comparable with first-class airline travel.

General aviation offers a broad range of products to the industry it serves. Some examples are spare parts, pilot accessories and clothing, aviation literature, tuition and training devices. It would not be unreasonable to suggest that general aviation, in Australia, if not in the world, makes the aerospace industry possible. Each country's airlines recruit heavily from its respective general aviation industry, and Australia is no exception. Pilots are probably unique in that they pay their own way to becoming professionals, in a very hard and competitive school.

Five years of work have gone into making the Australian Bicentennial Air Show one of the most unique events in the world. It offers the full perspective, from the most advanced to the most basic — truly something for everyone.

Jim Thorn, editor of Australia's most widely read aviation journal, *Australian Aviation*, had this to say in support of the Air Show: "I am proud of the effort that has gone into the making of the Air Show. The spin-offs for Australia are going to be enormous — it's going to create countless job opportunities and earn this country some big export dollars, which is precisely what it needs. This country, with a population of some 16 million people, has spent an enormous amount of money in aviation. It's nice to think that through our own technological advances we will see other countries buying Australian aerospace products. The Air Show offers the perfect venue to promote this — it's a combination of the best of all the other air shows, worldwide."



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MILITARY AIRCRAFT

RAAF

GENERAL DYNAMICS F-111 C

Description: Two-seat tactical strike and reconnaissance bomber
Power plant: Two 18,500lb st Pratt & Whitney TF-30-P-3 turbofans
Dimensions: Wingspan 19.2m; length 22.41m; height 5.22m
Weights: Empty 23,525kg; max take-off 41,504kg
Performance: Max speed at sea level 1390km/h; max speed at 12,190m, 2655km/h; tactical radius with 7257kg combat load for hi-lo-hi mission 2415km; ferry range with max internal fuel 6115km
Armament: One 20mm M-61A1 rotary cannon; max ordnance load of 13,608kg; external ordnance carried by four 1814kg swivelling wing stations and four fixed stations
Notes: First of type flown in 1964. Ordered by Australian government in 1963 for RAAF and 24 aircraft delivered. Known as F-111C, differ from F-111A in having stronger undercarriage and larger wing than FB-111A.

McDONNELL DOUGLAS F/A-18 HORNET

Description: Multi-mission light-weight fighter attack aircraft
Power plant: Two 15,800lb st General Electric F404-GE-400 turbofans
Dimensions: Wingspan 11.43m; length 17.07m; height 4.67m; wing area 36.79m
Weights: Empty 12,700kg; max take-off 25,400kg
Performance: Max speed at 10,970m, 1915km/h; landing speed 242km/h; combat ceiling 15,057m; combat radius in attack configuration 1073km; in fighter configuration 737km; ferry range 3700km
Armament: One M61 multi-barrel 20mm cannon in fuselage; nine stores stations for bombs or fuel tanks; two on fuselage for Sparrow missiles or sensor pods; four on wings for air-to-air missiles; air-to-surface missiles; bombs or fuel tanks; two at wingtips for sidewinder air-to-air missiles.
Notes: Chosen for the RAAF in December 1981. 56 single-seat and 18 two-seat being delivered to RAAF to equip Nos. 3, 75 and 77 Squadrons and one Operational Training Unit.

DASSAULT MIRAGE

Description: (III O F) Single-seat all-weather interceptor
Power plant: One SNECMA Atar 09C turbojet rated at 13, 624lb st with afterburning
Dimensions: Wingspan 8.22m; length 14.08m; height 4.5m; wing area 34m²
Weights: Empty 6525kg; max take-off 13,499kg
Performance: Max speed at 12,192m, 2230km/h; max stabilised speed 1911km/h; range cruising speed at 10,973m, 955km/h; tactical radius on internal fuel 290km/h
Armament: Two 30mm DEFA 5-52 cannon and 907kg stores on centreline plus two 453kg stores under wings. In intercept role primary armament is Matra R530 air-to-air missile
Notes: First of the series flown in 1955 and subsequently developed in a number of variants and supplied in large numbers to a number of air forces. Built under licence in Australia and 100 single-seat and 16 two-seat aircraft supplied. Now ending its life with RAAF and being replaced by F/A-18 Hornet.

MACCHI MB-326

Description: Two-seat trainer and light close-support aircraft
Power plant: One 2500lb st Bristol Siddeley Viper 11 turbojet
Dimensions: Wingspan 10.04m; length 10.5m; height 3.46m; wing area 19m²
Weights: Empty 2280kg; max take-off 3370kg
Performance: Max speed at 6000m, 815km/h; stalling speed 156km/h; rate of climb at sea level 1350m/min; service ceiling 12,500m; range 965km
Armament: Six strong points on wings to take various bombs and/or rockets
Notes: First of type flown in Italy in 1957. Licence built in Australia and 87 aircraft built. Has seen service with RAAF and RAN.

PILATUS PC-9

Description: Two-seat military training aircraft
Power plant: One 950shp Pratt & Whitney PT6A-62 turboshaft
Dimensions: Wingspan 10.12m; length 10.05m; height 3.26m; wing area 16.29m²
Weights: Empty 1685kg; max take-off 3100kg
Performance: Max speed at sea level 49km/h; max speed at 6100m, 556km/h; stalling speed 130km/h; initial rate of climb 1234m/min; service ceiling 11,582m; range at 3050m, 1111km
Notes: A more powerful development of the PC-7, the PC-9 was first flown in May 1984. 67 aircraft were built at Bankstown, NSW for the RAAF.

AESL CT-4 AIRTRAINER

Description: Two-seat military trainer
Power plant: One 210hp Continental IO-360-D six-cylinder air-cooled engine
Dimensions: Wingspan 7.92m; length 7.15m; height 2.59m; wing area 12m²
Weights: Empty 690kg; max take-off 1070kg
Performance: Max speed at sea level 290km/h; cruising speed at 1605m, 240km/h; range at 235km/h, 1300km; initial rate of climb 408m/min
Notes: A development of the Australian-designed Victa Aircruiser by AESL in New Zealand. 51 taken into service by RAAF.

LOCKHEED P-3C ORION

Description: Long-range maritime patrol aircraft
Power plant: Four turbo-props
Dimensions: Wingspan 20.37m; length 35.61m; height 10.3m; wing area 120.77m
Weight: Max take-off 64,410kg
Performance: Max speed at 4500m, 405 knots TAS; max endurance 17.7 hours; service ceiling 10,500m; ferry range 5000 nautical miles
Armament: Torpedos
Notes: The P-3B version entered service with the RAAF in 1968, later replaced by the P-3C, of which there are now two squadrons in service at RAAF Edinburgh, South Australia. The majority of the ex-RAAF P-3Bs are now flying with the Portuguese Air Forces.

BOEING 707-320C

Description: Long-range military transport
Power plant: Four 17,000lb st Pratt & Whitney JT-3D-3 turbofans
Dimensions: Wingspan 39.87m; length 41.68m; height 12.67m; wing area 234.2m²
Weights: Empty 66768kg; max take-off 151,315kg
Performance: Max cruising speed at 7620m, 965km/h; economical cruising speed 886km/h; initial rate of climb 1218m/min; service ceiling 11,885m; range with no reserves with max payload 6920km; range with max fuel 12,030km
Notes: First of the type flown in July 1954 and subsequently sold in large numbers to civil operators around the world. Served for many years with Qantas until replaced by the Boeing 747. Four ex-Qantas aircraft obtained by RAAF and used by No. 33 Squadron as transports. Two further aircraft obtained in 1988. To be converted for air-to-air refuelling of the FA-18 fighters.

BAC ONE-ELEVEN

Description: Medium-range commercial transport
Power plant: Two 10,600lb st Rolls Royce Spey RB163-2 turbojets
Dimensions: Wingspan 26.97m; length 28.5m; height 7.2m; wing area 91.04m²
Weights: Empty 20,061kg; max take-off 33,793kg
Performance: Max cruising speed at 7620m, 885km/h; economical cruising speed 816km/h; range with 5334kg payload, 2004km; range with 6234kg payload, 2843km
Notes: Developed by British Aerospace as a successor to the very successful Vickers Viscount, the first BAC One-Eleven flew in August 1963. Produced in a number of models. Two received by RAAF in 1968 and operated by No. 34 Squadron as VIP transports.

DASSAULT MYSTERE

Description: Government VIP aircraft
Power plant: Two 4315lb st General Electric CF700-2D-2 turbofans
Dimensions: Length 17.15m; height 5.32m; wingspan 16.3m; wing area 41m²
Weights: Empty 7240kg; max take-off 13,000kg
Performance: Max cruising speed 862km/h; economical cruise 750km/h; ceiling 12,800m; max range 3570km
Notes: Three operated by No. 34 Squadron, RAAF Fairbairn, Canberra, as government VIP aircraft. Scheduled for replacement in 1988-89.

LOCKHEED C-130 HERCULES

Description: Medium tactical transport
Power plant: Four 4910shp Allison T56-A-15 turboprops
Dimensions: Wingspan 40.41m; length 29.78m; height 11.66m; wing area 162.12m²
Weights: Empty 33,063kg, max take-off 70,310kg
Performance: Max speed 618km/h; max cruising speed 603km/h; economical cruising speed 547km/h; range with max payload with reserves, 3447km; max range 8150km; initial rate of climb 579m/min; service ceiling 8075m
Notes: The most successful military transport in recent years, with over 2000 delivered, and production continuing. Being supplied to the air forces of most western nations. 36 have been supplied to the RAAF; the first, the C-130A being received in 1958. These were later replaced and now No. 37 Squadron operates C-130Es and No. 36 Squadron operates the C-130H.

LOCKHEED C-130
HERCULES

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HAWKER SIDDELEY HS-748

Description: VIP transport/military navigation trainer
Power plant: Two 2450hp Rolls Royce Dart 550-2 turboprops
Dimensions: Wingspan 30.02m; length 20.42m; height 7.57m; wing area 73.35m²
Weights: Empty 12,110kg; max take-off 20,182kg
Performance: Max cruising speed at 3050m, 448km/h; initial rate of climb 402m/min; service ceiling 7600m; range with max payload 852km; range with max fuel 3150km
Notes: Designed as a replacement for the DC-3 and a direct competitor to the Fokker Friendship. 12 were purchased for the Australian armed services, two with No. 34 Squadron as VIP transports; eight as navigation trainers at RAAF, Sale; and two with the RAN for electronic warfare training.

GAF N22 and N24 NOMAD

Description: Utility transport
Power plant: Two 400shp Allison 250-B17B turboprops
Dimensions: Wingspan 16.46m; length (N22B) 12.5m; (N24) 14.35m; height 5.52m; wing area 30.2m²
Weights: Empty 2170kg; max take-off 3855kg
Performance: Max cruising speed at 1525m, 313km/h; cruising speed 282km/h; range with reserves at 3050m, 1482km; initial rate of climb 444m/min; service ceiling 7165m
Notes: Four Nomads were obtained for the RAAF in 1988, two N22s for range support work at RAAF Tindal in the Northern Territory and two N24s for liaison flying with the Aircraft Research and Development Unit at RAAF Edinburgh, South Australia.

DOUGLAS C-47 DAKOTA

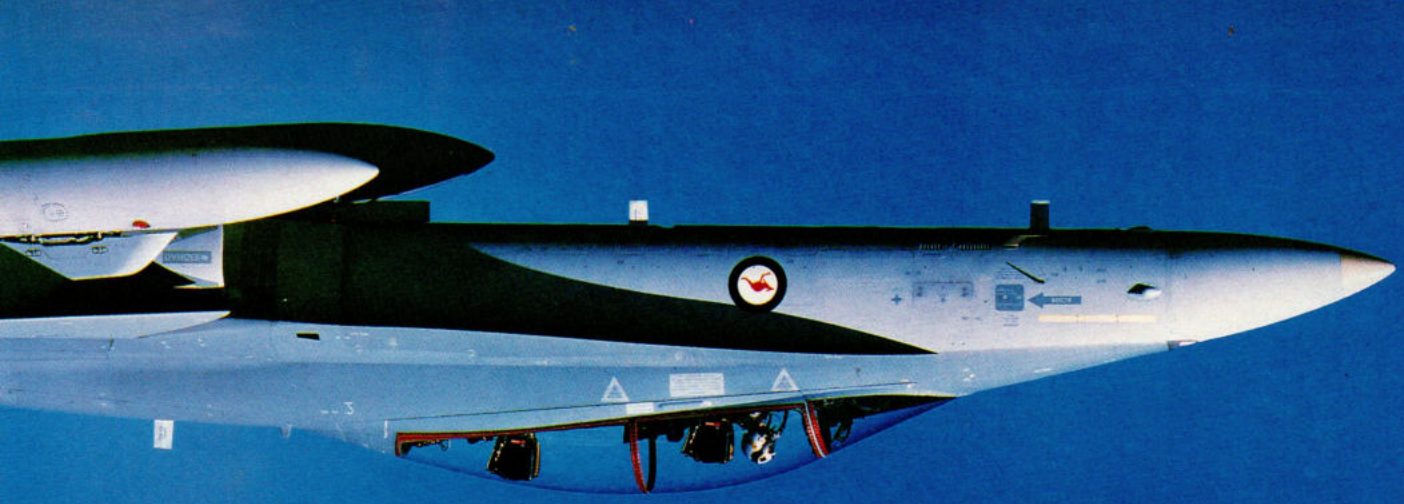
Description: Commercial and military transport
Power plant: Two 1200hp Pratt & Whitney R-1830-92 Twin Wasp radial engines
Dimensions: Wingspan 28.96m; length 19.66m; height 5.16m; wing area 91.7m²
Weights: Empty 8030kg; max take-off 12,700kg
Performance: Max speed 346km/h; max cruising speed 312km/h; economical cruising speed at 1829m, 266km/h; initial rate of climb 324m/min; service ceiling 6675m; range with max payload 563km; range with max fuel 2430km
Notes: The most famous and widely used transport aircraft of all time, with more than 10,000 built. First flown in December 1935, it saw extensive service in all theatres of WWII, in the Korean War, and as gunships in the Vietnam war. Large numbers saw service with the RAAF and RAN and with many civil operators in Australia.

BOEING CH-47C CHINOOK

Description: Heavy-lift helicopter
Power plant: Two 3750shp Lycoming T55-L-11 turboshafts
Dimensions: Rotor diameter 18.29m each; length 15.54m
Weights: Empty 9243kg; max take-off 20,865kg
Performance: Max speed at sea level 306km/h; cruising speed 254km/h; max inclined rate of climb 878m/min; mission radius 185km
Notes: First of type flew in September 1961 and since then built in large numbers for a number of the world's air forces. Also built under licence in Italy. Produced in a number of variants. 12 supplied to RAAF in 1974 and these operated with No. 12 Squadron at Amberley, Qld.

BELL UH-1H IROQUOIS

Description: Medium transport helicopter
Power plant: One 1400shp Lycoming T53-L-13 turboshaft
Dimensions: Rotor diameter 14.63m; length 12.8m;
Weights: Empty 2357kg; max take-off 4763kg
Performance: Max speed 204km/h; max cruising speed 179km/h; initial rate of climb 512m/min; hovering ceiling in ground effect 3170m; range 553km
Armament: May be fitted with mini-guns in each doorway; and air-to-ground rockets
Notes: Built in large numbers for civil and military operators around the world. Saw extensive service in the Vietnam war. Used by both RAN and RAAF, as well as with a number of civil operators. Also licence built in Italy, Japan and West Germany.



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RAAF

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SIKORSKY S-70A BLACK HAWK

Description: Tactical transport helicopter
Power plant: Two 1543shp General Electric T700-GE-700 turboshafts
Dimensions: Rotor diameter 16.23m; length 15.26m
Weight: Empty 4819kg; max take-off 9979kg
Performance: Max speed at sea level 360km/h; cruising speed 267km/h; vertical rate of climb 137.1m/min; hovering ceiling in ground effect 3048m; endurance 2.3-3hrs.
Armament: Provision for two M60 light machine guns, firing from the cabin, plus chaff/flare dispensers
Notes: Designed to meet a requirement for a utility tactical transport for the US Army. More than 1000 on order in Blackhawk, Nighthawk and Seahawk variants. Able to carry a squad of 11 equipped troops; and up to 3628kg slung externally. 39 on order for Australian Army.

AEROSPATIALE AS350 SQUIRREL

Description: Light general-purpose utility helicopter
Power plant: One 641shp Turbomeca Arriel turboshaft
Dimensions: Rotor diameter 10.69m; length 10.91m
Weights: Empty 1027kg; max take-off 1900kg
Performance: Max speed 267km/h; max cruising speed at sea level 230km/h; hovering ceiling in ground effect 3250m; service ceiling 5000m; initial rate of climb 576m/min; range 690km
Notes: The first of the series was flown in June 1974 and since then the type has been very popular, being sold in large numbers throughout the world. By the end of 1987 more than 1000 delivered.

CAC CA-25 WINJEEL

Description: Three-seat basic military trainer
Power plant: One 445hp Pratt & Whitney R-985-AN-2 nine-cylinder radial engine
Dimensions: Wingspan 11.81m; length 8.92m; height 2.52m; wing area 23.22m²
Weight: Empty 1471kg; max take-off 1923kg
Performance: Max speed 299km/h; cruising speed at 2590m, 265km/h; initial rate of climb 457m/min; endurance at 254m/min, 5½hrs; service ceiling 4816m
Notes: Designed as the standard training aircraft for the RAAF to replace the Tiger Moth and the Wirraway, the first Winjeel flew in February 1951. Subsequently replaced by the AESL Airtrainer. A number of Winjeels have been restored and are now operated privately.

AUSTER MK. 5

Description: Three-seat air-observation-post aircraft (warbird)
Power plant: One 130hp Lycoming 0-290-3/1 four-cylinder air-cooled engine
Dimensions: Wingspan 10.97m; length 6.83m; height 2.44m; wing area 17.2m²
Weights: Empty 526kg; max take-off 862kg
Performance: Max speed 209km/h; cruising speed 173km/h; initial rate of climb 289m/min; service ceiling 4572m; range 402km
Notes: The Austers Mks. 4 and 5, also known as Models G and J, were used in large numbers in Europe during WWII. After being declared obsolete in 1953, large numbers were civilianised.

BELL UH-1B IROQUOIS

Description: Medium transport helicopter (warbird)
Power plant: One 960shp Lycoming T53-L-5 turboshaft
Dimensions: Rotor diameter 14.68m; length 12.8m
Weights: Empty 2357kg; max take-off 4763kg
Performance: Max speed 204km/h; max cruising speed 179km/h; initial rate of climb 512m/min; range 553km
Armament: May be fitted with miniguns in doorways
Notes: The most prolifically produced helicopter of the West, the first Iroquois flew in 1955. Saw extensive service in Vietnam and served with both the RAN and RAAF. To be replaced by the Blackhawk in RAAF service and the Seahawk with the RAN.

CAC MUSTANG

Description: Single-seat fighter monoplane (warbird)
Power plant: One 1650hp Packard Merlin V-1650-3 Vee-twelve-cylinder liquid-cooled engine
Dimensions: Wingspan 11.3m; length 9.84m; height 3.7m; wing area 21.65m²
Weights: Empty 3232kg; max take-off 5262kg
Performance: Max speed at 1524m, 635km/h; initial rate of climb 1059m/min; service ceiling 12,771m; range 2092km
Notes: The Mustang was licence built by Commonwealth Aircraft Corp., at Fishermen's Bend, first aircraft being delivered to the RAAF in June 1945. In all 15,576 Mustangs built in USA and Australia. A number have been converted to civil use.

CAC CA-27 SABRE

Description: Single-seat fighter (warbird)
Power plant: One 7500lb st CAC-built Rolls Royce Avon 26 turbojet
Dimensions: Wingspan 11.31m; length 11.43m; height 4.4m; wing area 28.08m²
Weights: Empty 5487kg; max take-off 8460kg
Performance: Max speed at sea level 1126km/h; initial rate of climb 3657m/min; service ceiling 16,764m; range with max external fuel 1851km
Armament: Two 30mm Aden cannons and two sidewinder air-to-air missiles; or up to 544kg of bombs
Notes: An Australian development of the North American Sabre, fitted with a Rolls Royce Avon engine. First of type delivered to RAAF in August 1954 and continued in service as Australian front-line fighter with Nos 3, 75, 76, and 77 Squadrons until replaced by the Mirage.

DE HAVILLAND DH82 TIGER MOTH

Description: Two-seat training biplane (warbird)
Power plant: One 130hp de Havilland Gipsy Major I four-cylinder air-cooled engine
Dimensions: Wingspan 8.94m; length 7.3m; height 2.7m; wing area 22.2m^2
Weights: Empty 506kg; max take-off 828kg
Performance: Max speed at sea level 175km/h; cruising speed 145km/h; initial rate of climb 205km/h; service ceiling 4153m; range 458km
Notes: Probably the most famous training aircraft of all time and built in vast numbers for wartime training. Also built in Canada and Australia; 1085 built at Bankstown. Saw extensive service with training units of RAAF.

DE HAVILLAND DH 115 VAMPIRE T-35

Description: Two-seat advanced military trainer (warbird)
Power plant: One 3500lb st de Havilland Goblin 35 centrifugal-type turbojet
Dimensions: Wingspan 11.6m; length 10.5m; height 1.9m; wing area 24.34m^2
Weights: Empty 2347kg; max take-off 5057kg
Performance: Max speed at sea level 883km/h; max speed at 12,192m, 865km/h; initial rate of climb 1371m/min; range at 6096m, and 483km/h, 1002km
Armament: Two 20mm Hispano 404 cannons and eight 11.34kg or 27.2kg rockets
Notes: Designed as a jet trainer for the RAAF. Sold to a number of air forces around the world and licence built in India and Australia. Served for some years with the RAAF and RAN.

FOKKER TRIPLANE

Description: Single-seat triplane fighting scout (warbird)
Power plant: One 110hp Le Rhone rotary engine built by Thulin
Dimensions: Wingspan 7.19m; length 5.77m; height 2.95m
Weights: Empty 406kg; max take-off 586kg
Performance: Max speed 165km/h; service ceiling 6100m; endurance 1½hrs; time to climb to 3048m, 6 mins.
Armament: Two fixed Spandau machine guns firing forward
Notes: The most famous German fighter of WWI, although only 230 Dr1 Scouts were built. Flown by German aces, Baron Von Richthofen, Ernst Udet, Werner Voss and Hermann Goering. In recent years replicas of "The Barons" aircraft have been built around the world and one is owned by the RAAF Museum.

GAF JINDIVIK

Description: Pilotless target aircraft (warbird)
Power plant: One 1750lb st Bristol Siddeley Viper 8 turbojet
Dimensions: Wingspan 7.8m; length 7.1m; height 1.9m; wing area 9.47m^2
Weight: Max take-off 1323kg
Performance: Max speed 973km/h; service ceiling 16,764m; operational endurance with fuel allowances, 40.5mins; rate of climb at 12,192m, 1067m/min; max endurance at 16,764m, 66 mins.
Notes: Designed as a pilotless target aircraft, over 500 were built. Type supplied to RAAF, RAN, Great Britain, Sweden and US Navy.

GAF PIKA

Description: Single-seat research aircraft (warbird)
Power plant: One 1050lb st Armstrong Siddeley Adder ASA1 turbojet
Dimensions: Wingspan 5.8m; length 7.1m; wing area 7.06m^2
Weights: Empty 1043kg; max take-off 1315kg
Performance: Max speed at 8230m, 756km/h; initial rate of climb 1271m/min; service ceiling 9753m
Notes: Developed by the Government Aircraft Factories at Fishermen's Bend, Vic. in 1948 as a development aircraft for the proposed pilotless Jindivik target aircraft. Only two were built, and one of these survives as part of the collection of the RAAF Museum.

HAWKER DEMON

Description: Two-seat fighter biplane (warbird)
Power plant: One 560hp Rolls Royce Kestrel Vee 12-cylinder liquid-cooled engine
Dimensions: Wingspan 11.4m; length 9m; height 3.2m; wing area 32.3m^2
Weights: Empty 1505kg; max take-off 2117kg
Performance: Max speed at 4998m, 293km/h; time to climb to 1000m, 2.1mins; service ceiling 8382m; endurance 2.5hrs
Armament: Two 0.303in. Vickers machine guns firing forward and one 0.303in. Lewis gun firing aft.
Notes: The Demon was introduced into RAF service in 1933 and 304 were built. Saw service in the Abyssinian war in 1935. Total of 64 supplied to the RAAF in 1930s and served with Nos. 1, 2, 3, 12 and 22 Squadrons.

LOCKHEED VENTURA

Description: General reconnaissance and bomber aircraft (warbird)
Power plant: Two 2000hp Pratt & Whitney R-2800-31 Double Wasp 18-cylinder radial engines
Dimensions: Wingspan 20m; length 15.8m; height 4m; wing area 51.2m^2
Weights: Empty 9161kg; max take-off 14,096kg
Performance: Max speed at 4206m, 502km/h; cruising speed 264km/h; service ceiling 8016m; initial rate of climb 679m/min; range with six depth charges 2671km
Armament: Two 0.303in. Browning machine guns in ventral position, two or four guns in dorsal turret, 2 fixed 0.5in. in nose, provision for up to 1134kg of bombs
Notes: Similar to the Hudson but with a longer fuselage, more armament and more power. 1600 Venturas were built, the type being used by the RAAF in both the European and Pacific theatres.

SOPWITH PUP

Description: Single-seat biplane scout and training aircraft (warbird)
Power plant: One 80hp Le Rhone rotary engine
Dimensions: Wingspan 8.07m; length 5.88m; height 2.87m; wing area 23.6m²
Weights: Empty 357kg; max take-off 555kg
Performance: Max speed 179km/h; ceiling 5334m; endurance 3hrs
Armament: One Vickers or Lewis 0.303in. machine gun, fixed and firing forward.
Notes: One of the most successful British fighter aircraft of WWI, and some 1900 examples were built, the type entering service No. 54 Squadron Royal Flying Corp in 1916. 12 were received by the Australian Flying Corps and were used in the training role in Australia. One replica is owned and operated by the RAAF Museum.

SPITFIRE MK VIII

Description: Single-seat fighter and fighter bomber (warbird)
Power plant: One 1710hp Rolls Royce Merlin 63 12-cylinder Vee liquid-cooled engine
Dimensions: Wingspan 11.23m; length 9.54m; height 3.84m; wing area 22.5m²
Weights: Empty 2631kg; max take-off 3523kg
Performance: Max speed at 7620m, 656km/h; max cruising speed 521km/h; range on internal fuel 1062km; service ceiling 13,106m
Armament: Two 20mm Hispano cannons and four 0.303in Browning machine guns
Notes: Probably the most famous fighter of all time, 20,334 Spitfires were built. Mainly used in the European theatre, but 245 saw service with the RAAF.

RAN

SIKORSKY S-70B SEA HAWK

Description: Shipboard multi-role helicopter
Power plant: Two 1690shp General Electric T-700-GE-401 turbo shafts
Dimensions: Rotor diameter 16.36m; length 19.76m; height 5.18m;
Weights: Empty 6412kg; max take-off 9927kg
Performance: Max speed at sea level 269km/h; max cruising speed at 1525m, 249km/h; initial rate of climb 609m/min; service ceiling 4510m
Armament: Anti-submarine torpedoes and depth charges
Notes: Designed for anti-submarine warfare and anti-ship surveillance and targeting roles for US Navy. First of type flew in February 1978. 16 on order for RAN for six FFG class frigates.

WESTLAND SEA KING

Description: Anti-submarine warfare and search and rescue helicopter
Power plant: Two 1500shp Rolls Royce Gnome 1400-1 turbo shafts
Dimensions: Rotor diameter 18.9m; length 17.01m
Weights: Empty 6201kg; max take-off 9525kg
Performance: Max speed 230km/h; max continuous cruising speed at sea level 211km/h; hovering ceiling in ground effect 1525m; range with standard fuel 1230km
Armament: Anti-submarine torpedoes and depth charges
Notes: Developed by Westland in the UK from the Sikorsky S-61 but fitted with British engines: ten MK 50s obtained for RAN for operations from HMAS Melbourne. Now operate from Nowra.

WESTLAND WESSEX MK.31B

Description: Anti-submarine warfare and search-and rescue helicopter
Power plant: One 1650shp Napier Gazelle M 165C turboshaft
Dimensions: Rotor diameter 17.07m; length 14.74m
Weights: Empty 3447kg; max take-off 6350kg
Performance: Max speed 212km/h; max cruising speed 204km/h; max inclined climb rate 475m/min; hovering ceiling in ground effect 1798m; normal range 547km
Armament: One or two homing torpedoes
Notes: A development of the Sikorsky S-58 by Westland in the UK and produced in large numbers for a number of services for use in a variety of roles.

AEROSPATIALE AS350 SQUIRREL

Description: Light general-purpose utility helicopter
Power plant: One 641shp Turbomeca Arriel turboshaft
Dimensions: Rotor diameter 10.69m; length 10.9m
Weights: Empty 1027kg; max take-off 1900kg
Performance: Max speed 267km/h; max cruising speed at sea level 230km/h; hovering ceiling in ground effect 3250m; service ceiling 5000m; initial rate of climb 576m/min; range 690km
Notes: The first of the series was flown in June 1974 and since then the type has been very popular, being sold in large numbers throughout the world. By the end of 1987 more than 1000 delivered.

BELL OH-58 KIOWA

Description: Five-seat utility helicopter
Power plant: One 400shp Allison 250-C20B turboshaft
Dimensions: Rotor diameter 10.16m; length 9.5m
Weights: Empty 680kg; max take-off 1451kg
Performance: Max speed at sea level 225km/h; max cruising speed at sea level 214km/h; hovering ceiling in ground effect 3871m; max range 579km
Notes: First of type flown in January 1966 and built in substantial quantities in USA, and licence built in Italy and Australia. Over 7000 built for civil and military use.

HAWKER SIDDELEY HS-748

Description: VIP transport/military navigation trainer
Power plant: Two 2450ehp Rolls Royce Dart 550-2 turboprops
Dimensions: Wingspan 30.02m; length 20.42m; height 7.57m; wing area 73.35m^2
Weights: Empty 12,110kg; max take-off 20,182kg
Performance: Max cruising speed at 3050m, 448km/h; initial rate of climb 402m/min; service ceiling 7600m; range with max payload 852km; range with max fuel 3150km
Notes: Designed as a replacement for the DC-3 and a direct competitor to the Fokker Friendship. 12 were purchased for the Australian armed services, two with No. 34 Squadron as VIP transports; 8 as navigation trainers at RAAF, Sale; and two with the RAN for electronic warfare training.

BELL UH-1B IROQUOIS

Description: Medium transport helicopter
Power plant: One 960shp Lycoming T53-L-5 turboshaft
Dimensions: Rotor diameter 14.68m; length 12.8m
Weights: Empty 2357kg; max take-off 4763kg
Performance: Max speed 204km/h; max cruising speed 179km/h; initial rate of climb 512m/min; range 553km
Armament: May be fitted with miniguns in doorways
Notes: The most prolifically produced helicopter of the West, the first Iroquois flew in 1955. Saw extensive service in Vietnam and served with both the RAN and RAAF.

DE HAVILLAND DH82 TIGER MOTH

Description: Two-seat training biplane (warbird)
Power plant: One 130hp de Havilland Gipsy Major I four-cylinder air-cooled engine
Dimensions: Wingspan 8.94m; length 7.3m; height 2.7m; wing area 22.2m^2
Weights: Empty 506kg; max take-off 828kg
Performance: Max speed at sea level 175km/h; cruising speed 145km/h; initial rate of climb 205km/h; service ceiling 4153m; range 458km
Notes: Probably the most famous training aircraft of all time and built in vast numbers for wartime training. Also built in Canada and Australia; 1085 built at Bankstown. Saw extensive service with training units of RAAF.

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"That ship got a new lease on life with us. Turned out '18s did most of the flying, they were so reliable."

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MCDONNELL DOUGLAS

DOUGLAS C-47 DAKOTA

Description: Commercial and military transport (warbird)
Power plant: Two 1200hp Pratt & Whitney R-1830-92 Twin Wasp radial engines
Dimensions: Wingspan 28.96m; length 19.66m; height 5.16m; wing area 91.7m²
Weights: Empty 8030kg; max take-off 12,700kg
Performance: Max speed 346km/h; max cruising speed 312km/h; economical cruising speed at 1829m, 266km/h; initial rate of climb 324m/min; service ceiling 6675m; range with max payload 563km; range with max fuel 2430km
Notes: The most famous and widely used transport aircraft of all time, with more than 10,000 built. First flown in December 1935, it saw extensive service in all theatres of WWII, in the Korean War, and as gunships in the Vietnam war. Large numbers saw service with the RAAF and RAN and with many civil operators in Australia.

FAIREY FIREFLY

Description: Shipboard fighter and reconnaissance aircraft (warbird)
Power plant: One 2245hp Rolls Royce Griffon 12-cylinder Vee liquid-cooled engine
Dimensions: Wingspan 12.49m; length 11.28m; height 4.74m; wing area 30.66m²
Weights: Empty 4472kg, max take-off 6124kg
Performance: Max speed at sea level 509km/h; time to climb to 6095m, 15.5mins; service ceiling 8900m; range on standard fuel at 375km/h, 937km
Armament: Four 20mm Hispano cannon and provision for bombs and rockets
Notes: First of type flown in December 1941. Built over a period of 14 years, 1702 supplied to a number of air forces and navies, 108 supplied to RAN, a number of which saw service in Korea on board HMAS *Sydney*.

HAWKER SEA FURY

Description: Single-seat carrier-borne fighter bomber (warbird)
Power plant: One 2550hp Bristol Centaurus 18-cylinder radial engine
Dimensions: Wingspan 11.7m; length 10.6m; height 4.6m; wing area 26m²
Weights: Empty 4191kg; max take-off 5602kg
Performance: Max speed at 5486m, 740km/h; initial rate of climb 1316m/min; range 1126km; range with two 409 litre drop tanks, 1674km; time to climb to 6095m, 5.7 minutes; stalling speed 167km/h
Notes: The last piston-engine fighter bomber to be manufactured in quantity in the UK. Total of 615 were built, with 101 being used by RAN. Operated from HMAS Sydney and Naval Air Station at Nowra.

GRUMMAN TRACKER

Description: Carrier-borne anti-submarine patrol aircraft (warbird)
Power plant: Two 1525hp Wright R-1820-82-WA nine-cylinder radial engines
Dimensions: Wingspan 22.13m; length 13.26m; height 5.06m; wing area 46.08m²
Weights: Empty 8505kg; max take-off 13,222kg
Performance: Max speed at sea level 426km/h; patrol speed at 450m, 241km/h; service ceiling 6400m; stalling speed 119km/h; ferry range 2095km
Armament: Homing torpedoes, depth bombs, depth charges, rockets etc. carried in bomb-bay and on underwing racks
Notes: For many years one of the most important anti-submarine aircraft in the western inventory. 32 saw service with the RAN operating from HMAS *Albatross* at Nowra and on board the aircraft carrier HMAS *Melbourne*.

AUSTRALIAN ARMY AVIATION

BELL OH-58 KIOWA

Description: Five-seat utility helicopter
Power plant: One 400shp Allison 250-C20B turboshaft
Dimensions: Rotor diameter 10.16m; length 9.5m
Weights: Empty 680kg; max take-off 1451kg
Performance: Max speed at sea level 225km/h; max cruising speed at sea level 214km/h; hovering ceiling in ground effect 3871m; max range 579km
Notes: First of type flown in January 1966 and built in substantial quantities in USA, and licence built in Italy and Australia. Over 7000 built for civil and military use.

GAF N22 and N24 NOMAD

Description: Utility transport
Power plant: Two 400shp Allison 250-B17B turboprops
Dimensions: Wingspan 16.46m; length (N22B) 12.57m; (N24) 14.35m; height 5.52m; wing area 30.2m²
Weights: Empty 2170kg; max take-off 3855kg
Performance: Max cruising speed at 1525m, 313km/h; cruising speed 282km/h; range with reserves at 3050m, 1482km; initial rate of climb 444m/min; service ceiling 7165m
Notes: The first of the Australian designed and built Nomads flew in 1971 and subsequently 170 were built. 22 are in service with the Australian Army, operated mainly on battlefield liaison tasks by 173 General Support Squadron at Oakey, Queensland.

PILATUS PC-6 TURBO PORTER

Description: Light utility aircraft
Power plant: One 522eshp Pratt & Whitney of Canada PT6A-20 turboprop
Dimensions: Wingspan 15.2m; length 11.08m; height 3.2m; wing area 28.5m²
Weights: Empty 1088kg; max take-off 2199kg
Performance: Max speed 281km/h; cruising speed at 3048m, 254km/h; initial rate of climb 433m/min; service ceiling 7925m; max range 936km
Notes: Designed by Pilatus at Staus in Switzerland to seat 7 passengers and a pilot and with the ability to operate into small rough strips. 19 examples obtained by the Australian Army.

BELL 47G-3B-1 SIOUX

Description: Three-seat utility helicopter (warbird)
Power plant: One 260hp Lycoming TVO-435-AIA six-cylinder air-cooled engine
Dimensions: Rotor diameter 11.33m; length 9.63m; height 2.83m
Weights: Empty 813kg; max take-off 1338kg
Performance: Max speed 169km/h; cruising speed at 1524m, 138km/h; hovering ceiling in ground effect 4907m; service ceiling 5242m; range 439km
Notes: First of the type flown in 1943. The first really successful light utility helicopter. Over 100 have seen service with civil operators and the Australian Army. Still in use for cattle mustering.

CESSNA 0-1 BIRD DOG

Description: Two-seat liaison and observation monoplane (warbird)
Power plant: One 213hp Continental C-470-11 six-cylinder air-cooled engine
Dimensions: Wingspan 10.97m; length 7.86m; height 2.22m; wing area 16.17m²
Weights: Empty 732kg; max take-off 1088kg
Performance: Max speed at sea level 185km/h; cruising speed at 2524m, 167km/h; initial rate of climb 350m/min; service ceiling 5639m; range 853km
Notes: Developed from the Cessna 170 to meet a requirement of the US Army for an observation aircraft. Built in large numbers for military service and saw service in Vietnam. One obtained in Vietnam for Australian Army Aviation Museum.

CANADA

LOCKHEED CP140 AURORA

Description: Long-range maritime patrol aircraft
Power plant: Four turbo-props
Dimensions: Wingspan 20.37m; length 35.61m; height 10.3m; wing area 120.77m
Weight: Max take-off 64,410kg
Performance: Max speed at 4500m, 405 knots TAS; max endurance 17.7 hours; service ceiling 10,500m; ferry range 5000 nautical miles
Armament: Torpedoes
Notes: Entered service in 1980 to replace Canadair Argus. Designed primarily for anti-submarine warfare and operated from bases at Vancouver Island (with four Auroras in service) and Nova Scotia (14 in service). A version of the US Navy's P-3 Orion, but with avionics from the S-3 Viking carrier ASW aircraft.

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He was eventually shot down by ground fire over France in 1941 and taken prisoner. By this time he had scored 29 aerial victories.

"That is just how it was!" — the very words of Bob Stanford-Tuck when he first saw Robert Taylor's painting 'Victory over Dunkirk'. The view looks almost vertically down on the port of Dunkirk, with Bob's Mk.V Spitfire pulling hard around in a tight defensive turn. His third victim of the day, an Me110, already on its way down and trailing smoke.

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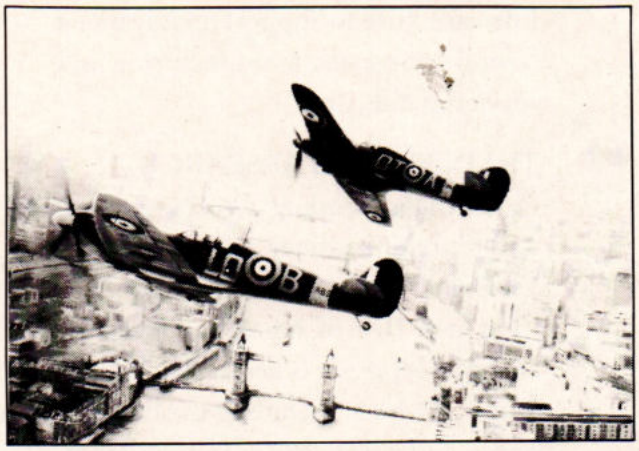

A magnificent painting by Robert Taylor, specially commissioned to commemorate the Anniversary of the Allied Victory in World War II, and 40 years of peace in Europe. Taylor brings to life the two greatest British fighter aircraft ever to fly, in a gigantic vista over London and the River Thames.

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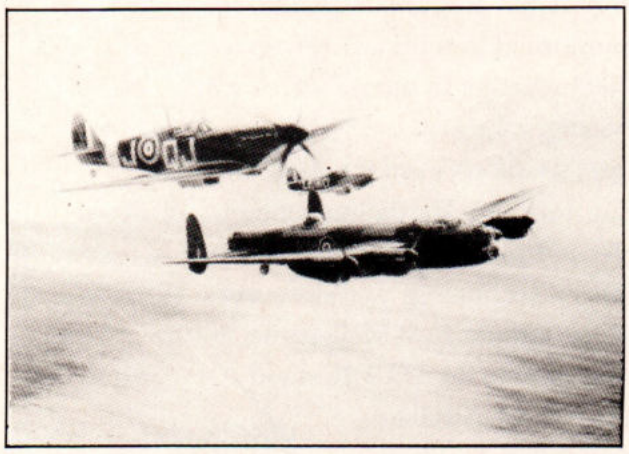
Overall size: 24 x 20 inches. Edition size: 1500

Price: $120.00 plus $5.00 Shipping



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Of those who manned the Spitfires, Hurricanes and Lancasters of WWII, few can claim more outstanding achievements than the three signatories to this beautiful full colour Special Edition print. Decorated for their heroic exploits many times over, their flying careers are legendary.

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Overall size: 27½ x 20½ inches. Edition size: 1000

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ITALY

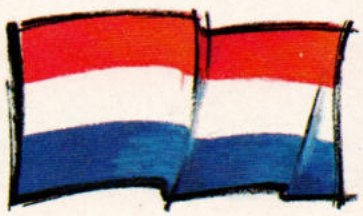
SIAI-MARCHETTI SF-260

Description: Four-seat cabin monoplane
Power plant: One 260hp Lycoming 0-540-E4A5 six-cylinder air-cooled engine
Dimensions: Wingspan 8.22m; length 7.01m; height 2.6m; wing area 10.08m²
Weights: Empty 675kg; max take-off 1100kg
Performance: Max speed at sea level 370km/h; cruising speed at 1951m, 357km/h; initial rate of climb 548m/min; service ceiling 6513m; range 1690km
Notes: Designed by Stelio FRATI in Italy as a high-performance light aircraft, first of the type being flown in July 1964. Delivered to Air France and Sabena as a trainer and also developed as counter-insurgency aircraft and delivered to a number of air forces.

SIAI-MARCHETTI S-211

Description: Tandem two-seat basic trainer
Power plant: One 2500lb st Pratt & Whitney Canada JT 15D-4C turbofan
Dimensions: Wingspan 8.43m; length 9.31m; height 3.80m; wing area 12.60m²
Weights: Empty 1615kg; max take-off 3100kg
Performance: Max speed at 6095m, 667km/h; max initial climb rate 1158m/min; max range with internal fuel 1668km; ferry range 2483km
Armament: Max external load 600kg distributed between four wing stations
Notes: First of type flown in April 1981. Ordered for air forces of Haiti and Singapore. Designed as a low-cost training and light attack aircraft.

THE NETHERLANDS



LOCKHEED P-3C ORION

Description: Long-range maritime patrol aircraft
Power plant: Four 4910eshp Allison T56-A-14W turboprops
Dimensions: Wingspan 30.37m; length 35.61m; height 10.29m; wing area 120.77m²
Weights: Empty 27,890kg; max take-off 60,558kg
Performance: Max speed at 4570m, 761km/h; normal cruising speed at 7620m, 639km/h; loiter endurance at 457m, 12.3hrs; mission radius 4075km
Armament: Weapons, bay houses, depth bombs and torpedoes up to a max ordnance load of 6220kg
Notes: Military variant of the Lockheed Electra. First of type flown in 1959. In service with a number of the world's air forces. The Royal Netherlands Navy operates 13 Orions on maritime reconnaissance duties.

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FOKKER F27M MARITIME

Description: Maritime surveillance, anti-submarine and anti-shipping aircraft
Power plant: Two 2410ehp Rolls Royce Dart 552 turboprops
Dimensions: Wingspan 29m; length 23.55m; height 8.7m; wing area 70.00m²
Weights: Empty 13,726kg; max take-off 21,565kg
Performance: Max speed at 6100m, 474km/h; cruising speed 463km/h; typical search speed 269-324km/h; service ceiling 7620m; max range 5000km
Armament: External strong points, three on each wing, capable of carrying Exocet, Bae Sea Eagle or Harpoon missiles; and various loads comprising four torpedoes
Notes: One of a number of military derivatives of the well-known Fokker Friendship series, the first of the type flying in 1984. Other variants include the Maritime Enforcer, the Sentinel etc. Deliveries have been made to a number of the world's air forces.

NEW ZEALAND

BOEING 727-22C

Description: Medium-range commercial airliner
Power plant: Three 14,500lb st Pratt & Whitney JT8D-9 turbofans
Dimensions: Wingspan 32.92m; length 43.64m; height 10.36m; wing area 157.9m²
Weights: Empty 44,235kg; max take-off 94,347kg
Performance: Max speed at 6250m, 999km/h; max cruising speed at 7530m, 964km/h; economical cruising speed at 9145m, 917km/h; range with 11,974kg payload and normal reserves 4585km
Notes: For some time the most successful jet airliner of all time, with more than 1800 delivered, the number built has only recently been exceeded by its stablemate, the Boeing 737. First of the type flown in February 1963. Used extensively in Australia by both Ansett and Australian Airlines.

FOKKER F-27 FRIENDSHIP

Description: Commercial airliner
Power plant: Two 2230eshp Rolls Royce Dart 532-7 turboprops
Dimensions: Wingspan 29m, length 23.56m; height 8.51m, wing area 70.00m²
Weights: Empty 10,295m; max take-off 20,410kg
Performance: Max cruising speed 486km/h; initial rate of climb 450m/min; service ceiling 9000m; range with max payload 2070km
Notes: One of the most successful airliners in recent years, the Friendship has been sold in considerable numbers to the world's airliners, and more than 60 examples have operated with Australian airlines. First of the type flown in 1955. Three former Air New Zealand F-27s are used by the RNZAF for navigator and air electronics training and coastal surveillance.

HAWKER SIDDELEY ANDOVER C. 1

Description: Military tactical transport
Power plant: Two 3245shp Rolls Royce Dart RDa 12 Mk 301 turboprops
Dimensions: Wingspan 29.92m; length 23.77m; height 9.15m; wing area 77.2m²
Weights: Empty 12,996kg; max take-off 22,680kg
Performance: Cruising speed 426km/h; max rate of climb 360m/min; service ceiling 7300m; range with max payload 500km; range with max fuel 1865km
Notes: A development of the Avro 748 series for the RAF, incorporating a rear loading ramp with doors capable of opening in flight. Major modifications were made to the airframe to suit military use. 10 obtained for the RNZAF in 1976 and used by No.42 Squadron at Whenuapai, Auckland.

LOCKHEED C-130H HERCULES

Description: Medium tactical transport
Power plant: Four 4910eshp Allison T56-A-15 turboprops
Dimensions: Wingspan 40.41m; length 29.78m; height 11.66m; wing area 162.12m²
Weights: Empty 33,063kg, max take-off 70,310kg
Performance: Max speed 618km/h; max cruising speed 603km/h; economical cruising speed 547km/h; range with max payload with reserves, 3447km; max range 8150km; initial rate of climb 579m/min; service ceiling 8075m
Notes: The first operator of the C-130H outside the United States, the RNZAF received five of the type in 1965, operated by No. 40 Squadron from RNZAF Base Auckland.

LOCKHEED P-3K ORION

Description: Long-range maritime patrol aircraft
Power plant: Four turbo-props
Dimensions: Wingspan 20.37m; length 35.61m; height 10.3m; wing area 120.77m
Weight: Max take-off 64,410kg
Performance: Max speed at 4500m, 405 knots TAS; max endurance 17.7 hours; service ceiling 10,500m; ferry range 5000 nautical miles
Armament: Torpedoes
Notes: The P-3K is an updated version of the P-3B, which entered service with the RNZAF in 1966. Five aircraft were originally obtained, and a sixth was a former RAAF P-3B. The update includes a new data handling and display system, radar, infrared detection system, INS and Omega navigation equipment.

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AST 9018 Y&R MELB

McDONNELL DOUGLAS A-4 SKYHAWK

Description: Single or two-seat shipboard attack aircraft
Power plant: One 9300lb st Pratt & Whitney 352-P-8A turbojet
Dimensions: Wingspan 8.38m; length 13.07m; height 4.62m; wing area 24.15m²
Weights: Empty 4508kg; max take-off 12,437kg
Performance: Max speed at sea level 1086 km/h; max speed at 10,668m, 984km/h; combat radius with 1814kg external stores 611km; ferry range 3927km; service ceiling 14,600m
Notes: Now some 30 years old, the first Skyhawk flew in 1954 and at that time established a world speed record of 1118.5km/h. More than 3000 were built for a number of air forces. Was used by RAN on board HMAS *Melbourne*. 17 in operation with RNZAF.

PAPUA NEW GUINEA

GAF N22 and N24 NOMAD

Description: Utility transport
Power plant: Two 400shp Allison 250-B17B turboprops
Dimensions: Wingspan 16.46m; length (N22B) 12.5m; (N24) 14.35m; height 5.52m; wing area 30.2m²
Weights: Empty 2170kg; max take-off 3855kg
Performance: Max cruising speed at 1525m, 313km/h; cruising speed 282km/h; range with reserves at 3050m, 1482km; initial rate of climb 444m/min; service ceiling 7165m
Notes: Six Nomads are used by the air element of the Papua new Guinea Defence Force for coastal surveillance.

ISRAELI IAI-200 ARAVA

Description: Stol military transport
Power plant: Two 783eshp Pratt & Whitney PT6A-34 turboprops
Dimensions: Wingspan 20.88m; length 12.99m; height 5.21m; wing area 43.68m²
Weights: Empty 3532kg; max take-off 7710kg
Performance: Max speed at 3050m 326km/h; economical cruising speed at 3050m, 311km/h; range with max fuel 1297km; service ceiling 8100m; rate of climb at sea level 477m/min
Armament: In gunship configuration, three 12.7mm Browning machine guns, senobuoys and four MK44 torpedoes
Notes: Designed by Israel Aircraft Industries as a rugged STOL light transport, the first aircraft flew in 1969. Small numbers supplied to New Guinea Defence Force.

UNITED KINGDOM

BRITISH AEROSPACE HAWK 100

Description: Two-seat advanced trainer and light attack aircraft
Power plant: One 5700lb st Rolls Royce Adour 861 turbofan
Dimensions: Wingspan 9.39m; length 11.85m; height 4m; wing area 16.69m²
Weights: Empty 3629kg; max take-off 8342kg
Performance: Max speed 1000km/h at sea level; max speed at 10,970m; 933km/h; max rate of climb 360m/min; tactical radius with four 250kg bombs and two 590 litre drop tanks 1095km
Armament: Five external ordnance stations for max of 3100kg. May also carry two AIM-9 Sidewinder air-to-air missiles
Notes: First of series flown in August 1974 and examples delivered to RAF, Finland, Kenya, Indonesia, Zimbabwe, Dubai, Kuwait etc. Series 100 has inertial navigator, headup display, laser range-finder and weapon-aiming computer.

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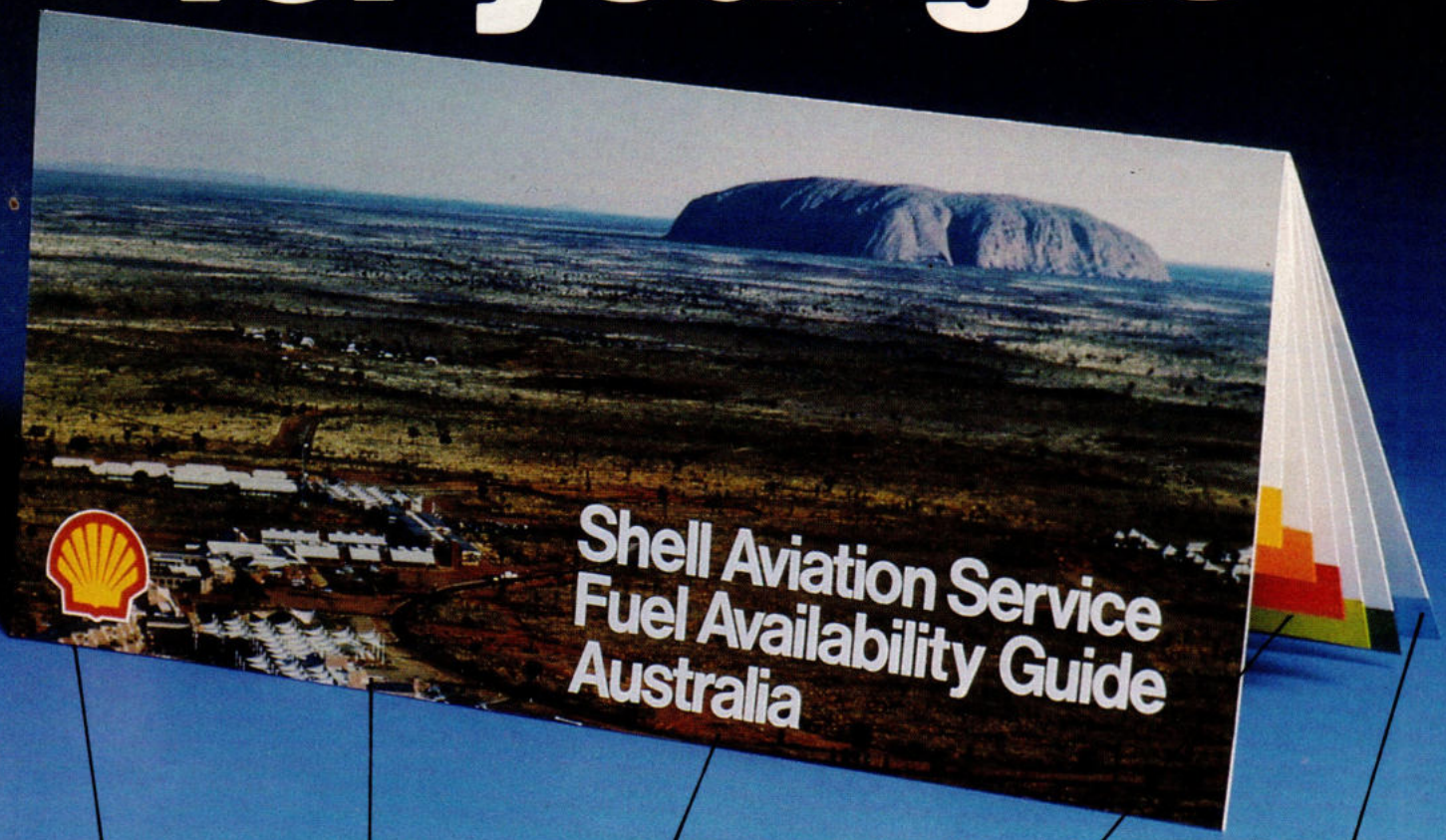

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BRITISH AEROSPACE HAWK 200

Description: Single-seat multi-role fighter
Power plant: One 5845lb st Rolls Royce Turbomeca Adour 871 turbofan
Dimensions: Wingspan 9.39m; length 11.3m; height 4.15m; wing area 16.69m²
Weights: Empty 4127kg; max take-off 8618kg
Performance: Max speed 1037km/h; service ceiling 15,240m; tactical radius in close support role 322km; with five 454kg and four 227kg bombs in interdiction role 1073km; ferry range 3606km
Armament: Two 25mm Aden or two 27mm Mauser cannon and max external warload of 3493kg
Notes: First of type flown in May 1986. Development of two-seat Hawk trainer supplied to RAF and number of air forces. Retains 80% commonality with the Hawk 100. Hawk 200 dedicated to the single-seat multi-combat role.

BRITISH AEROSPACE SEA HARRIER FRS.1

Description: V/STOL shipboard multi-role fighter
Power plant: One 21,500lb st Rolls Royce Pegasus 104 vectored-thrust turbofan
Dimension: Wingspan 7.7m; length 14.5m; height 3.7m; wing area 18.68m²
Weights: Empty 6374kg; max take-off 11,880kg
Performance: Max speed 1160km/h; max speed at 10,975m 977km/h; tactical radius, reconnaissance role, with two 455 litre drop tanks 520km; endurance with drop tanks in combat air patrol role 1.5 hours at 185km
Armament: Five external stations with ability to take up to 3630kg or ordnance. Typical load includes two 30mm cannon and four AIM-9L sidewinder air-to-air missiles
Notes: First Sea Harrier flown in August 1978 and since then has entered service with Royal Navy and Indian Navy. New variant known as FRS.1 entered production in 1988 and has two additional missile stations with provision for AIM-120 missiles and updated electronics.

BRITISH AEROSPACE NIMROD MR.2

Description: Long-range maritime patrol aircraft
Power plant: Four 12,160lb st Rolls Royce RB. 168-20 Spey Mk 250 turbofans
Dimensions: Wingspan 35m; length 38.63m; height 9.01m; wing area 197.05m²
Weight: Max take-off 83,460kg
Performance: Max speed 926km/h; max transit speed 880km/h; typical ferry range 8340 to 9265km; endurance 12 hours
Armament: Weapons bay in fuselage accommodating full range of anti-submarine warfare weapons such as Stingray home torpedoes, mines, depth charges. Provision for Aerospatiale AS12 missiles under wings
Notes: First of 46 Nimrod anti-submarine aircraft flown in June 1968, known as the MR Mk 1. In 1979 a number were converted to MR.2 configuration, with 60 times more computer power and equipped with Searchwater radar, a new acoustic system compatible with the Barra sonobuoy, and Electronic Warfare Support Measures equipment in the wingtip pods.

HERCULES C. 3

Description: Medium tactical transport
Power plant: Four 4910eshp Allison T56-A-15 turboprops
Dimensions: Wingspan 40.41m; length 29.78m; height 11.66m; wing area 162.12m²
Weights: Empty 33,063kg, max take-off 70,310kg
Performance: Max speed 618km/h; max crusing speed 603km/h; economical cruising speed 547km/h; range with max payload with reserves, 3447km; max range 8150km; initial rate of climb 579m/min; service ceiling 8075m
Notes: The RAF acquired 66 Hercules C. 1s, the equivalent of the C-130H. 30 of these have been converted to the C. 3 with a 4.6m fuselage stretch.

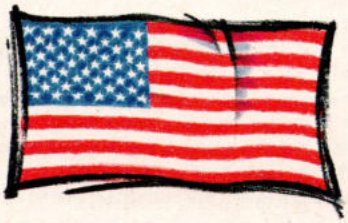
LOCKHEED TRISTAR KC.1

Description: Flight refuelling tanker and military freighter
Power plant: Three 50,000lb st Rolls Royce RB.211-524B4 turbofans
Dimensions: Wingspan 50.09m; length 50.05m; height 16.87m; wing area 329m²
Weights: Empty 110,163kg; max take-off 245,000kg
Performance: Max cruising speed at 10,670m, 964km/h; long range cruising speed at 10,060m 889km/h; range with max payload 7780km
Notes: Flight crew of three with 12-seat crew rest area and accommodation for 204 passengers in transport role. Max fuel capacity of tanker 96,726kg. Six ex-British Airways and three ex-Pan Am aircraft obtained and converted for RAF.

PANAVIA TORNADO F.3

Description: Two-seat air defence interceptor
Power plant: Two 9000lb st (dry) and 17,000lb st (with reheat) Turbo-Union RB.199-34R Mk 104 turbofans
Dimensions: Wingspan 13.90m; length 18.06m; height 5.7m; wing area 30m²
Weights: Empty 14,500kg; max take-off 25,400kg
Performance: Max speed at sea level, 1480km/h; max speed at 12,190m, 2333km/h; time to 9145m 1.7mins; operational radius in combat air patrol role with two 1500 litre drop tanks 560 to 725km; ferry range 4265km
Armament: One 27mm IWKA-Mauser cannon plus four BAe Sky Flash and four AIM-9L sidewinder air-to-air missiles
Notes: The Mk 3 Tornado is the definitive air defence variant of the type, deliveries to the UK, West Germany and Italy commencing in 1986. It differs from the Mk 2 in having Mk 104 engines, extensions to the reheat pipes, automatic wing sweep selection and modifications to its electronic equipment.

UNITED STATES



BOEING KC-135 STRATOTANKER

Description: Flight refuelling tanker and military freighter
Power plant: Four 18,000lb st Pratt & Whitney TF33-P-5 turbofans
Dimensions: Wingspan 39.88m; length 41m; height 11.68m; wing area 226.03m²
Weight: Empty 46403kg; max take-off 124,965kg
Performance: Max speed 966km/h; cruising speed at 10,670m, 853km/h; rate of climb at sea level 393m/min; total mission time 5.5hrs; time to 9300m, 27 mins.
Notes: In 1954 the USAF announced it was to purchase a variant of the Boeing 707 for transport and tanker duties. The first aircraft was obtained in August 1956. Subsequently over 700 were obtained and are still in use in a variety of models. The type saw extensive service during the Vietnam war.

BOEING B-52 STRATOFORTRESS

Description: Long-range heavy bomber
Power plant: Eight 17,000lb st Pratt & Whitney TF33 turbofans
Dimensions: Wingspan 56.42m; length 48.03m; height 12.39m; wing area 371.6m²
Weight: Max take-off 221,353kg
Performance: Max speed 958km/h; cruising speed 819km/h; service ceiling 16,765m; unrefuelled maximum range 16,093km
Armament: One remote controlled 20mm Vulcan cannon in tail turret; plus up to 20 AGM-69 SRAM and nuclear free-fall bombs.
Notes: Prototype of the B-52 series, it flew in April 1952 and subsequently entered service with the USAF. The B-52 has regularly undergone updating programs and is expected to remain in service until 2000, with more than 300 aircraft still in service.

LOCKHEED C-141B STARLIFTER

Description: Heavy military strategic transport
Power plant: Four 21,000lb st Pratt & Whitney TF33-P-7 turbofans
Dimensions: Wingspan 48.74m; length 51.34m; height 11.97m; wing area 299.90m²
Weight: Empty 68,056kg; max take-off 155,580kg
Performance: Max cruising speed at 11,590m, 824km/h; range with max payload (44,450kg) 4264km; max unrefuelled range with 27,150kg, 6950kg
Notes: 285 C-141A Starlifters built for USAF up to 1968. Conversion program commenced in 1978 to convert entire fleet to C-141B model by increasing fuselage length by 7.12m, various other modifications, and adding in-flight refuelling capability.

McDONNELL DOUGLAS F-15 EAGLE

Description: Single-seat air superiority fighter
Power plant: Two 23,800lb st Pratt & Whitney F-100-PW-100 turbofans
Dimensions: Wingspan 13.05m; length 19.43m; height 5.63m; wing area 56.5m²
Weights: Empty 12,700kg; max take-off 25,401kg
Performance: Max speed at low altitude, 1482km/h; max radius of action 4631km; max rate of climb 12,192m/min; service ceiling 19,203m
Armament: One 20mm M61A1 cannon and up to eight air-to-air missiles, i.e. four AIM-7F Sparrow III and four AIM-9L sidewinders
Notes: The most important fighter in the USAF armoury, the Eagle is in operational service in Europe, Israel, Saudia Arabia and Japan.

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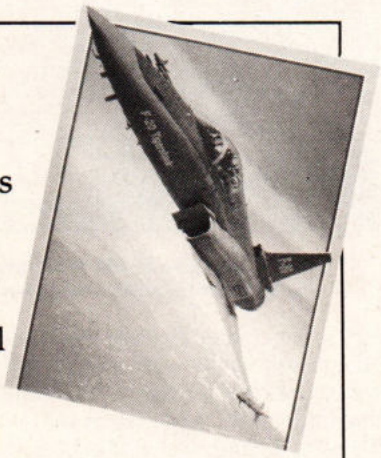

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From Chaff to Strafe

Recreated airfields recall the transformation of pastures to war zones. By Peter Gamble

Australian SE-5As on the grass runway of Palestine in 1918; and, at right, 80 Squadron Kittyhawks being re-armed in the Moluccas in 1944 (AWM Neg No. B1617)

The two public days at the Bicentennial Air Show offer enthusiasts the most concise display ever staged in this country. In compliance with the Air Show's theme of "yesterday, today and tomorrow", visitors are able to inspect aircraft from the First World War right through to the latest designs in military and civil excellence. Those early aircraft with fabric and dope coverings and wires strung between the "extra" wings are a far cry from the computerised aircraft of the late '80s. Yet, it's important to keep in perspective how young a field aeronautics really is. It was only on December 17, 1903 that Wilbur and Orville Wright wrote themselves into history when they conducted the first powered flight of a heavier-than-air machine at Kitty Hawk in North Carolina. At the time of this Air Show, powered flight will still be a little shy of being 84 years old. From the early stick and rudder days, aircraft have now evolved to "fly by wire" — that is, they are flown by a sophisticated computer which directs numerous control surfaces to deliver the most efficient flight path for given conditions; this computer accepts the pilot's input through his controls but will ignore excessive inputs that could endanger the

81
07

aircraft. The F/A-18 Hornet has this facility, as does the new Airbus A320. But let us now return to an era when powered flight was less than 11 years old — the commencement of the First World War.

The Air Show is presenting a display that has been painstakingly prepared by the Rising Sun Museum of Australian Military History. It depicts an operational airfield of the Australian Flying Corps somewhere in France, replete with period aircraft, correctly uniformed squadron members, anti-aircraft emplacements, and mess and quarters. Two years of planning and travelling around Australia collecting stores and material and arranging for the aircraft to be present have made this display possible.

No doubt, enthusiasts will recognise many of the hallowed flying machines. There are a Sopwith Pup and a Fokker DR1 triplane (the Red Baron's aircraft); both of these machines are now owned and operated by the RAAF's Point Cook Museum. Also on show is a replica of one of the finest British fighters in the Great War, the SE5 or Scouting Experimental, built by the Royal Aircraft Factory. It was hoped that a replica of a Nieuport 11 would be ready in time for the Air Show. This aircraft was used exclusively by the Americans in the latter stages of the Great War; the replica was being built at a house in Sydney's Balmain! Elsewhere on the field at Richmond, visitors can view an Avro 504 and a DH9; these two fine examples of WW1 military aircraft will also be remembered for their service in pioneering routes for Qantas.

Every effort has been made to depict a realistic and representative site for the occasion. Squadron members are attired in authentic military uniforms of the period, which were actually a variation of the Australian Army uniform and somewhat cavalry-like. Not all colours and insignia worn are still available, and thus many labour-intensive hours have been spent in reproducing these embellishments. A number of nursing staff are in attendance at the site, also in period costume, and a number of French civilians, adding yet another touch of realism.

The Australian Army has been of immense assistance to the organisers, providing the necessary tentage and sandbags for the airfield, as well as a fine selection of weapons for a static display; many of these weapons were actually captured in action by members of the First AIF. The Army's assistance in procuring WWI uniforms has also helped to make the presentation appear more realistic.

Static displays augment the overall image, including scale models of other aircraft and dirigibles, and even facsimiles of two anti-aircraft guns. The aim is for visitors to leave the site with the impression that they have stepped back 70 years in time and glimpsed what it must have been like to have flown and fought with a squadron of the Australian Flying Corps.

Aviation continued to evolve after the First World War. By the time the world experienced its next major conflict, 21 years after the armistice of WWI, the aircraft were much larger and faster, and biplanes and triplanes had given over to monoplanes. Some of the trainers were in keeping with the older style, however, such as the immortal Tiger Moth, which was used for thousands of pilots of the Empire Flying Scheme to learn the ropes.

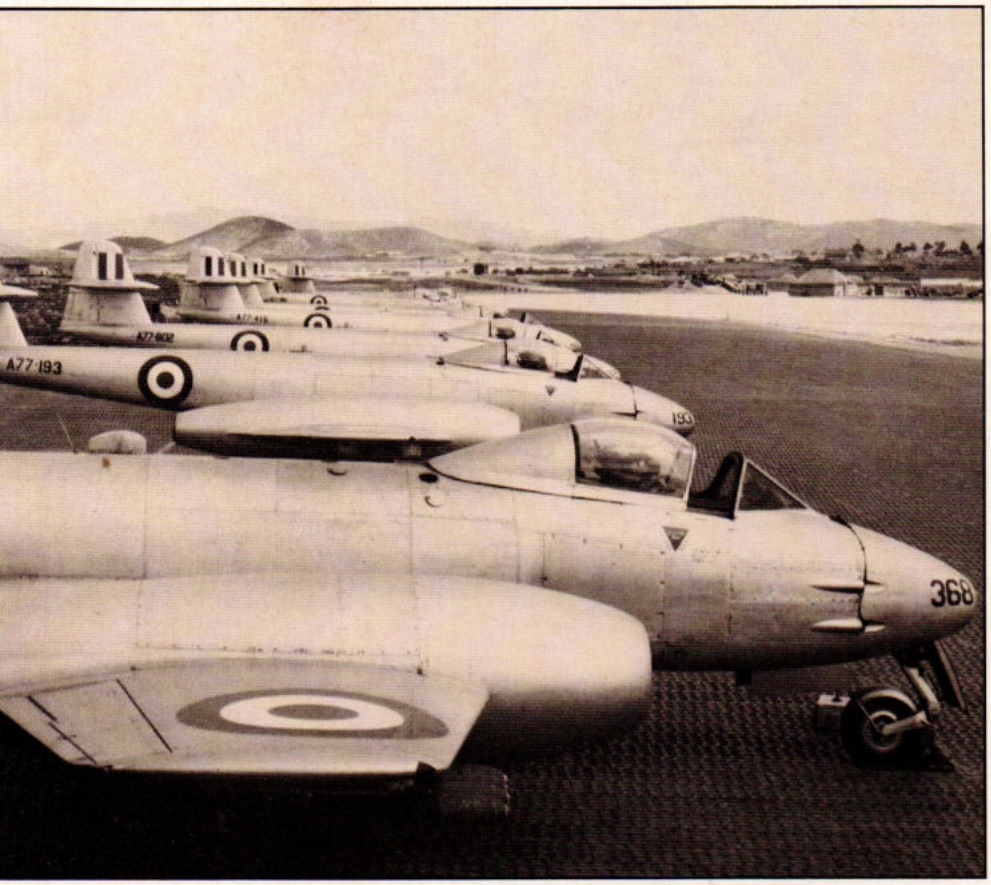
Those early aircraft with fabric and dope coverings are a far cry from the computerised aircraft of the '80s

The Antique Military Veteran Collectors Society has staged a special presentation depicting a Second World War airstrip. A utility control tower similar to those used in the Pacific theatre of war has been erected, along with revetments and copies of anti-aircraft guns. A tent contains relics from the period — uniforms, and paraphernalia such as aircraft instruments, bombsights, bombs, and portions of airframes. There are pieces of the famous wooden Mosquito and remains of two Beaufighters ("whispering death") recovered from the Kimberleys. These Beaufighters belonged to No. 30 Squadron, and one of them is reputed to have shot down several enemy aircraft during WWII.

The aircraft on display here will delight enthusiasts. There is a Boeing-Stearman PT-17, a Fiat G59B, a Lockheed Ventura, a Wirraway, a Harvard, a Messerschmitt Bf 109, a Mustang, and, of course, a Spitfire. The Spitfire is one of the classic aircraft of all time. More than 40 variations were produced, and it was the only British aircraft to continue in production throughout the war. Numbers exceeded 20,000, making it the most widely produced British aircraft ever. It was powered by the famous Rolls Royce Merlin, a V-12 super-charged engine with inter-cooler that delivered 2000hp, giving a speed approaching 450 knots — an incredible speed for that time. The original armament on the Spitfire was eight machine guns; these were later replaced by four cannons in some models.

Two lesser conflicts in which Australia took an active role following the World Wars were those in Korea and Vietnam. Aircraft used in these two scenarios are also on display, adjacent to the WWII exhibition. Visitors can see a Sea Fury, a Firefly, a Bell 47 helicopter (à la *MASH*), and the Sabre jet. The Mustang was used again in Korea; it actually proved, in many cases, a more useful attack aircraft when strafing troops and trains than the Gloster Meteor, with its slower speed allowing pilots a longer time to aim. The Sabre used by Australians in Korea was a variation of the American model (the P-86), built under licence in Victoria at the Government Aircraft Factory; unlike the US version, the Australian variant was fitted with a British-built Avon jet engine and modification was necessary to accommodate the larger Avon. In combat, the Sabre proved a better aircraft below 9000m; above that level, the Russian MiGs were formidable.

Another aircraft that deserves special mention is the Douglas Dakota, used by Australians in WWII, Korea, and the Malayan Emergency. The Douglas company originally designed the Dakota as the DC-3. It was test-flown exactly 32 years after the Wright Brothers had taken to the air. Between 1936 and 1939, it proved its worth by becoming the first aircraft to operate profitably without government subsidies, and eventually was satisfying 75



Vampires of 77 Squadron on steel-meshed hardstands in Korea, at top; and, at cluttered Vung Tau airbase in Vietnam, 9 Squadron Iroquois return from a mission

per cent of America's transport requirements. When war broke out, it was produced as a military version, the C47, and operated in every theatre of war as a transport aircraft. When production ceased in 1946, 11,000 Dakotas had been built. A number of military and passenger versions can be seen at the Air Show. Although the design is now more than 50 years old, charter versions still fly profitably. Many devotees argue that it is the most successful aircraft of all time.

Vietnam saw a new line-up of aircraft used by Australians. The Iroquois helicopter, Cessna 180, Bird Dog, Winjeel trainer, and the Caribou and Hercules C130. It's interesting to note that the original Winjeel (an Aboriginal word for "young eagle") couldn't spin in its original design — not a very desirable trait for a trainer. This was rectified by moving the rudder forward. The Canadian-designed Caribous are still in service with the RAAF today. They earned a fine reputation in Vietnam as a military transport. Three were lost when they were caught on the ground under attack, but a story is proudly told of another that was landing during a mortar attack. A shell exploded in front of the aircraft, sending lethal shrapnel at the aircraft; it made 80 holes in the Caribou, flattened its tyres, and wounded the crew. They still turned around and took off . . . the aircraft was later repaired and returned to service!

The Hercules is also still in service today and has a fine record of service with the RAAF. Hundreds of thousands of trouble-free hours have been recorded with this aircraft.

This represents a brief overview of what can be seen and enjoyed on October 15 and 16. Much more could be written on each individual model and its accomplishments, if only space permitted. Similarly, much more could be written regarding the quantum leaps made in aviation in the brief 84 years of its evolution. Someone once wrote that the Wright brothers commenced our journey to the stars. With current technology, this journey to our nearest star, Alpha Centauri (the brighter of the Southern Cross pointers), would still take many thousands of years. To our minds, it remains inconceivable — just as it must have been to the Wright brothers that one day we would walk on the moon.

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QPR 5353 mojo.MDA/L

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BOB LIVINGSTONE

A beautifully restored Zero fighter, at top; the same aircraft when it was found, at right; and WWII American trainer, Ryan PT22

Sweet Birds of Youth

Veterans of the air still inspire passion. Bob Livingstone looks at the old-timers

Two of the most popular display groups at the Air Show are the warbirds and vintage aircraft. While not able to compete with the sheer brute power and noise of the jet fighters and bombers of the modern air arms, these aircraft evoke feelings of nostalgia and grace, colourfully marking a bygone age of aviation.

Despite the significant contribution these craft are making at the Australian Bicentennial Air Show in 1988, if we were to wind the clock back 10 years, all the warbirds would disappear and only the vintage aeroplanes would be on display. Warbird is a fairly loose description for ex-military aircraft that have been retired from active service but are kept in flying condition by enthusiasts — the "Spam Cans" turned out by modern manufacturers are not for them. To fit into the category, aircraft do not have to be combat machines; training types that were stepping stones to fighters are also included.

Although the aeroplane has been an essential tool for Australians since the early '20s, flying did not really get into its stride until after the Second World War. During the war years, private and commercial flying (except on behalf of the military) ceased altogether, and yet many Australians were exposed to flying both as aircrew and passengers while serving in the forces. The demand for commercial aviation after the cessation of hostilities soon outstripped the availability of aircraft.

The Royal Australian Air Force had large stocks of aircraft that were no longer required, some of which were considered suitable for civil use after modification. These were the trainers (Tiger Moth and Anson), light bombers (Hudson and Catalina) and the light aircraft that were compulsorily acquired by the RAAF at the beginning of the war. The remainder of the aircraft on the inventory were assessed as unsuitable for civilian use, and any requests to place these aircraft on the civil register were refused. Most of the unwanted aircraft were put up for public tender, with a precious few kept for eventual museum display. By far the majority of the 900 Beauforts, 550 Beaufighters, 850 Kittyhawks and 650 Spitfires went to scrap metal merchants, were melted down and simply vanished. A lot of the 1000 Ansons and 400 Oxfords went to farmers' properties at knock-down prices, and mouldered away or were burnt in bush fires.

Amazingly, some survived, squirrelled away by eccentrics who just had to have one. Some were flown illegally by pilots turned farmers, but these soon became unairworthy and were pushed into barns and forgotten. The years passed, and more post-war types were added to the unwanted list. The stored aircraft earmarked for museums became a nuisance and were turned out to make room for more useful items.

In the '60s some of the Mustang fighters that had soldiered on in the Squadrons of the Citizen Air Force were added to the civilian register on contract work for the military as target tugs and the like, under special dispensations from the Department of Civil Aviation (DCA) — making Mustangs the first Australian warbird. Some were flown (again illegally) by farmers,

but this time the DCA stepped in and stopped them. One or two people managed to persuade the department that they should be allowed to fly ex-military fighters, but in June 1973 when a civilian-owned and operated Mustang crashed, killing the pilot, the DCA forbade any further operations.

It was not until 1980, after a geat deal of pressure had been brought to bear by people who realised Australia was losing its aviation history that the Department of Transport relented and allowed the operation of "Historic and Ex-Military Aircraft" under guidelines laid down in an Air Navigation Regulation numbered 108A. The conditions are very strict, limiting the number of hours the aircraft may be flown, allowing specific crew only to fly in the aircraft and restricting the types that may be operated. Despite the controls imposed, without ANR 108A we would not have the opportunity to see and marvel at these magnificent fighters and bombers. That the confidence of the authorities has not been misplaced is illustrated by the almost accident-

Despite these aircraft being built to deal death, they surprise with their beauty of design and bright unit markings

free history of the warbirds since permission was granted.

The sheer cost of operating these high-powered aircraft is sufficient to limit the total number we can expect to see in Australia. An idea of running costs can be given if we look at two warbirds at different ends of the spectrum. The Hawker Fury, a post-war naval fighter with a 2550hp radial engine, more than one of which you will find on display, costs approximately $1000 an hour to operate; a Piper L-4 Grasshopper, used as an artillery spotter in the Second World War, fitted with a 65hp engine, would cost about $40 an hour.

Purchase prices vary a great deal too: that Fury, fully restored and registered in Australia under ANR 108A, would set you back about $350,000; the Grasshopper, about $15,000. It is possible to obtain both aircraft for a lot less, but they would probably be what are termed "basket cases" — in very poor condition, with parts missing and requiring a total rebuild.

One way of cutting down costs is through group ownership, involving purchasing a share in a particular aircraft, the cost being determined by the type of aeroplane and the number of shares. Each shareholder pays a fixed monthly amount to cover the cost of maintenance, insurance and repayments, and then an hourly rate to operate the aircraft. This system has allowed a lot of people to be part of the warbird or vintage scene, even though they could not afford an aeroplane by themselves. A number of aviation museums maintain a percentage of their aircraft in flying condition, the principal of these being the RAAF Museum (Point Cook) and the Naval Aviation Museum (Nowra).

Australia has a good selection of aviation museums, each state except Tasmania being well represented. Some of these museums have provided static display examples for the History of Military Aviation display, in particular the RAAF Museum and the Australian War Memorial. Approximately 350 aircraft are displayed or in storage at the various museums throughout Australia, and in addition there are about 90 flying warbirds, with another 125 under long-term restoration to flying status. Fewer than 30 per cent of the flying aircraft are the original RAAF aircraft, the remainder being more recent imports.

Many of the aircraft displayed here are not the original aeroplanes that operated under the Royal Australian Air Force flag. Because of shortsighted attitudes displayed in earlier years, virtually all the airframes have disappeared, and many types are completely extinct. Australian enthusiasts have been able to import many of the types from overseas because the warbird movement is a worldwide phenomenon.

There is one particular warbird that presently dominates the field: the North American Harvard, with 17 examples either flying or under restoration to fly. Built as a trainer, this aircraft is pleasant and reliable to fly, fully aerobatic, and at around $350 per hour it is a mid-range-cost warbird. At the other end of the scale is the Supermarine Spitfire, only two of which are flying in Australia, the last of the Spitfires purchased by the RAAF during the Second World War. The First World War is repre-

Clockwise from top, sharp speedster of its day, the 1930s Avro Avian; a high-performance Australian Spitfire Mk VIII that flew from Philippines bases; Avro Baby; long-range Mustang fighter used in the Pacific; Harvard trainer; and the Harvard prior to its restoration

sented by replicas of fighters such as the Sopwith Pup and Fokker Triplane — it has been necessary to build replicas as only five original First World War types are left, none of them capable of flight.

After the warbirds come the vintage machines, which can be seen in the History of Civil Aviation display. The pilots and engineers who keep these aircraft flying are a different breed from their warbird colleagues. The majority of these aircraft are biplanes made of wood and fabric, dating from a gentler era of aviation than the warbirds. These were designed mainly for civil use, most with open cockpits and speeds of around 75 knots.

Australia's oldest flying vintage machine is a De Havilland Gipsy Moth built in 1925, and a Westland Widgeon built in 1928 is still flying. Over 350 vintage aeroplanes are registered in Australia, 160 of which are De Havilland Tiger Moths. Another 30 Tigers are being rebuilt. Just as the Harvard dominates the warbirds, the Tiger Moth dominates the vintage scene. These delighful biplanes are the exception to the rule in that they were built as a basic military trainer (more than 1000 in Australia and some 5000 altogether) but were released onto the civil market after the war, requiring little or no modification and available at very reasonable prices. Sheer numbers have ensured their longevity.

De Havilland-built light aeroplanes form around 75 per cent of the surviving vintage machines in Australia. The next most numerous vintage aircraft is the Auster, a post-war cabin-class tourer of which some 140 are registered. American aeroplanes are featured, in particular the early, all-metal, twin-engined commercial types such as the Lockheed 10 and Douglas DC-2, which far outclassed their British counterparts.

As you stroll through the History of Military Aviation and History of Civil Aviation display areas, you will see many of the types you have read about here; you will be able to see just how fragile the early aeroplanes were and wonder how they were capable of flights of such magnitude. Despite the fact that the military aircraft were built to deal death, they will surprise you with their beauty of design and bright unit markings. Each of these aircraft has been preserved through the effort and dedication of private individuals, and they stand as memorials to the pioneer airmen, airwomen and servicemen who flew them when each craft was at the cutting edge of technology.

CIVIL AIRCRAFT

General

BEECH E95 TRAVEL AIR

Description: Four-seat twin engine cabin monoplane

Power plant: Two 180hp Lycoming 0-360-BIB four-cylinder air-cooled engines

Dimensions: Wingspan 11.53m; length 7.72m; height 2.9m; wing area 18m²

Weights: Empty 1159kg; max take-off 1905kg

Performance: Max speed at sea level 338km/h; economical cruising speed 313km/h; initial rate of climb 381m/min; range 1665km

Notes: Essentially a scaled down Twin-Bonanza with the cabin of the Bonanza and wings, tail and undercarriage of the Mentor. First of the type flown in August 1956.

BEECH B33 DEBONAIR

Description: Four-seat cabin monoplane

Power plant: One 225hp Continental IO-470-J six-cylinder air-cooled engine

Dimensions: Wingspan 10m; length 7.7m; height 2.5m; wing area 16.5m²

Weights: Empty 784kg; max take-off 1315kg

Performance: Max speed at sea level 313km/h; cruising speed at 3353m, 289km/h; initial rate of climb 308m/min; service ceiling 6035m; max range 1883km

Notes: A high-performance touring aircraft with a retractable undercarriage introduced into the Beech range in 1959. 2230 were built and 15 appear on the Australian register.

BEECH F33A BONANZA

Description: Four/six-cabin monoplane

Power plant: One 285hp Continental IO-520-B six-cylinder air-cooled engine

Dimensions: Wingspan 10.2m; length 8.13m; height 2.5m; wing area 16.8m²

Weights: Empty 981kg; max take-off 15.42kg

Performance: Max speed 338km/h; cruising speed 319km/h; initial rate of climb 356m/min; service ceiling 5443m; max range 1648km

Notes: The current production example of the Model 33, which has been in existence since 1959. Some 2600 examples of all versions of the Bonanza have been built, with 15 Bonanza 33 variants in Australia.

BEECH A36 BONANZA

Description: Four/six-seat cabin monoplane

Power plant: One 300hp Continental IO-550-B six-cylinder air-cooled engine

Dimensions: Wingspan 10.21m; length 8.38m; height 2.57m; wing area 16.80m²

Weights: Empty 1019kg; max take-off 1655kg

Performance: Max speed at sea level 340km/h; max cruising speed at 1830m 326km/h; max rate of climb at sea level 368m/min; service ceiling 3638m; range at max cruise 1622km

Notes: Developed from the 35-series Bonanza but with a conventional tail. Available with normally aspirated or turbo-charged engine. More than 100 registered in Australia.

BEECH B55 BARON

Description: Four/six-seat business and executive aircraft

Power plant: Two 260hp Continental IO-470-L six-cylinder air-cooled engines

Dimensions: Wingspan 11.53m; length 8.53m; height 2.9m; wing area 18.5m²

Weights: Empty 1468kg; max take-off 2812kg

Performance: Max speed at sea level 372km/h; economical cruising speed 320km/h; initial rate of climb 516m/min; service ceiling 5883m; range 1836km

Notes: First of type flew in February 1960 and more than 4000 built in a variety of models, some pressurised, some with turbocharged engines etc. Over 100 registered in Australia.

CESSNA 152

Description: Two-seat training monoplane

Power plant: One 110hp Continental 0-235-L2C four-cylinder air-cooled engine

Dimensions: Wingspan 9.97m; length 7.34m; height 2.59m; wing area 14.6m²

Weights: Empty 500kg; max take-off 757kg

Performance: Max speed at sea level 204km/h; cruising speed at 2438m, 198km/h; service ceiling 4480m; rate of climb at sea level 218m/min; ranges 648km

Notes: First of the series flown in September 1957. In production for many years and over 7300 built. Used by many aero clubs in Australia and 420 appear on the register.

CESSNA 172

Description: Four-seat training and touring aircraft

Power plant: One 145hp Continental 0-300-C six-cylinder air-cooled engine

Dimensions: Wingspan 11.02m; length 8.2m; height 2.7m; wing area 16.17m²

Weights: Empty 571kg; max take-off 1043kg

Performance: Max speed at sea level 222km/h; economical cruising speed at 3048m, 164km/h; initial rate of climb 196m/min; service ceiling 3993m; max range 1158km

Notes: The most popular light aircraft of all time, with more than 36,000 built. Licence built in France. Used extensively by aero clubs over the years. 845 registered in Australia.

CESSNA 180A

Description: Four/five-seat touring monoplane

Power plant: One 230hp Teledyne Continental 0-470-U six-cylinder air-cooled engine

Dimensions: Wingspan 10.92m; length 7.81m; height 2.36m; wing area 16.2m²

Weights: Empty 769kg; max take-off 1270kg

Performance: Max speed at sea level 263km/h; cruising speed at 2440m, 263km/h; rate of climb at sea level 335m/min; service ceiling 5395m; range at 2440m, 1528km

Notes: Designed as a utility aircraft, the Cessna 180 was very successful with more than 6000 built, and over 120 registered in Australia. It was used by Australian Army for some years.

CESSNA 182

Description: Four-seat light touring monoplane

Power plant: One 230hp Continental 0-470-R six-cylinder air-cooled engine

Dimensions: Wingspan 10.92m; length 8.55m; height 2.71m; wing area 16.2m²

Weights: Empty 744kg; max take-off 1338kg

Performance: (182K) Max speed at sea level 270km/h; cruising speed at 1981m, 257km/h; service ceiling 5395m; rate of climb at sea level 271m/min; max range at 185km/h at 3048m, 1424km

Notes: Introduced into the Cessna range in 1956 and more than 19,000 built in various models. Also now available with retractable undercarriage. Over 600 appear on Australian register.

CESSNA 206

Description: Six-seat utility aircraft

Power plant: One 300hp Teledyne Continental IO-520-F six-cylinder air-cooled engine

Dimensions: Wingspan 10.92m; length 8.61m; height 2.83m; wing area 16.2m²

Weights: Empty 870kg; max take-off 1633kg

Performance: Max speed at sea level 289km/h; cruising speed at 1981m, 272km/h; rate of climb at sea level 280m/min; service ceiling 4511m; max range 1667km

Notes: A very popular utility aircraft which may be fitted with floats or landplane undercarriage. Over 7500 examples built and 180 registered in Australia.

CESSNA 207

Description: Six/seven utility aircraft

Power plant: One 300hp Continental IO-520-F six-cylinder air-cooled engine

Dimensions: Wingspan 10.92m; length 9.8m; height 2.92m; wing area 16.2m²

Weights: Empty 942kg; max take-off 1729kg

Performance: Max speed at sea level 278km/h; cruising speed at 2438m, 251km/h; initial rate of climb 247m/min; service ceiling 4054m; range at 210km at 3048m, 111km

Notes: A lengthened development of the Model 206 with the ability to carry almost a tonne of cargo in the 5.48m³ available in the fuselage.

CESSNA 208 CARAVAN I

Description: Utility transport

Power plant: One 600hp Pratt & Whitney PT6A-114 turbo-prop

Dimensions: Wingspan 15.8m; length 11.46m; height 4.32m; wing area 25.97m²

Weights: Empty 1682kg; max take-off 3311kg

Performance: Max cruising speed at 3050m, 342km/h; max rate of climb at sea level 367m/min; service ceiling 9145m; stalling speed 134km/h; range with fuel allowances 1833km

Notes: The newest utility transport in the Cessna range, becoming available in 1984. Can carry up to 13 passengers. Cabin has a volume of 9.67m³ for cargo.

CESSNA 402

Description: Business and executive aircraft

Power plant: Two 300hp Continental TS10-520-E six-cylinder air-cooled engines

Dimensions: Wingspan 12.15m; length 11m; height 3.56m; wing area 18.18m²

Weights: Empty 1758kg; max take-off 2858kg

Performance: Max speed at 4877m, 424km/h; max cruising speed 356km/h; rate of climb at sea level 491m/min; service ceiling 7980m; range at 276km/h at 3048m, 903km

Notes: First of the series flown in 1965. Since then it has been very successful in the commuter airline role and as a business aircraft. 77 appear on the Australian register.

CIVIL AVIATION AUTHORITY

THE CIVIL AVIATION AUTHORITY OF AUSTRALIA
welcomes guests and visitors to the

AUSTRALIAN BICENTENNIAL AIR SHOW

See us at the CAA Corporate Exhibit - in front of the Aerospace Expo Pavilions - and at the CAA Pilot Centre, in Airfield '88. (look for the CAA flags)

ABOUT THE CAA

The Civil Aviation Authority became operational on July 1.

It is responsible both for safety standard setting and day-to-day regulatory control of the aviation industry. It has operational responsibility for air traffic control, flight advisory services, communications, navigation and surveillance systems, rescue and fire fighting services at airports, with other functions including design, and implementation of Airways functions. All of which can be seen in our display.

The Authority will also provide an examination service at the show to give pilots from country areas an opportunity to attempt examinations which are normally difficult to arrange.

There will also be briefings which will assist pilots sitting examinations.

A safety seminar will be held on Friday commencing at 9.30am.

For overseas pilots attending the show, there are arrangements for them to validate their licence for operations in Australia. (For more information: ask at the CAA exhibit or the CAA Pilot Centre).

The staff of the CAA look forward to seeing you and wish you all an enjoyable Air Show.

CHRISTEN EAGLE

Description: Two-seat high-performance aerobatic biplane

Power plant: One 200hp Avco Lycoming AE10-360-A1D four-cylinder air-cooled engine

Dimensions: Wingspan 6.07m; length 5.64m; height 1.98m; wing area 11.61m²

Weights: Empty 465kg; max take-off 725kg

Performance: Max speed at sea level 296km/h; max cruising at 1825m, 254km/h; stalling speed 94km/h; max rate of climb at sea level 645m/min; service ceiling 5180m; range with max fuel 611km

Notes: First of the type flown in February 1977. Produced in kit form by Christen Industries Inc of Afton, Wyoming. Metal construction with fabric covering.

DE HAVILLAND CANADA DHC-2 BEAVER

Description: Light utility transport

Power plant: One 450hp Pratt & Whitney R-985-AN-1 radial engine

Dimensions: Wingspan 14.63m; length 9.22m; height 2.74m; wing area 23.23m²

Weights: Empty 1293kg; max take-off 2313kg

Performance: Max speed at 1524m, 262km/h; cruising speed 230km/h; initial rate of climb 311m/min; service ceiling 5486m; range on internal fuel 732km

Notes: First of type flown in August 1947 and since then has been very successful in the utility role with both civil and military operators. 30 appear on the Australian register, a number of which are on floats.

GAF NOMAD SEARCHMASTER

Description: Light maritime patrol and surveillance aircraft

Power plant: Two 400shp Allison 250-B17B turboprops

Dimensions: Wingspan 16.46m; length 12.57m; height 5.52m; wing area 30.10m²

Weights: Empty 2170kg; max take-off 3855kg

Performance: Max cruising speed at 1525m, 313km/h; cruising speed 282km/h; range with reserves at 3050m, 1482km; typical mission 8 hrs, at 259km/h; initial rate of climb 444m/min; service ceiling 7165m

Notes: A development of the Nomad utility transport, the Searchmaster was produced in two models. The B fitted with a Bendix RDR 1400 radar and the L with a Litton LASR-2 radar.

GULFSTREAM 1000

Description: Business and executive aircraft

Power plant: Two 820shp Garrett AiResearch TPE 331-10-S01K turboprops

Dimensions: Wingspan 15.89m; length 13.10m; height 4.55m; wing area 25.95m²

Weights: Empty 3270kg; max take-off 5080kg

Performance: Max cruising speed at 6700m, 571km/h; economical cruising speed at 10,670m 474km/h; initial rate of climb 853m/min; range with max fuel 3855km

Notes: First of this series was flown in May 1980 and it is a development of the Aero Commander series. Able to seat six, up to a maximum of 11. A number have been obtained by the Department of Aviation in a multi-mission role.

LAKE LA-4 BUCCANEER

Description: Four-seat light amphibian

Power plant: One 200hp Lycoming IO-360-AIB four-cylinder air-cooled engine

Dimensions: Wingspan 11.58m; length 7.6m; height 2.84m; wing area 15.79m

Weights: Empty 705kg; max take-off 1220kg

Performance: Max speed 241km/h; cruising speed 211km/h; stalling speed 72km/h; max range at economical cruising speed 1327km; initial rate of climb 365m/min; service ceiling 4480m

Notes: First of the series flown in July 1948. One of the new amphibians still in production. More than 30 have been registered in Australia over the years.

MAULE M-4 ROCKET

Description: Four-seat cabin monoplane

Power plant: One 210hp Continental IO-360-A four-cylinder air-cooled engine

Dimensions: Wingspan 9.4m; length 6.88m; height 1.9m; wing area 14.5m²

Weights: Empty 635kg; max take-off 1043kg

Performance: Max speed 277km/h; cruising speed 257km/h; stalling speed 90km/h; initial rate of climb 411m/min; range 885km

Notes: One of a series of light STOL monoplanes built in considerable numbers by Maule Aircraft Corp since 1960. Built in a number of versions with engines of varying power.

MOONEY 201

Description: Four-seat cabin monoplane

Power plant: One 200hp Lycoming IO-360-A3B6D four-cylinder air-cooled engine

Dimensions: Wingspan 11m; length 7.52m; height 2.55m; wing area 16.24m²

Weights: Empty 758kg; max take-off 1243kg

Performance: Max speed at sea level 325km/h; max cruising speed 314km/h; initial rate of climb 314m/min; service ceiling 5730m; max range with max fuel 1963km

Notes: First of the Mooney series was flown in August 1953 and since then the type has been in continuous production in a variety of models. The type has been very popular and over 120 are registered in Australia. The Mooney 205 is a slightly more refined version of the 201.

MOONEY 252

Description: Four-seat cabin monoplane

Power plant: One 210hp Continental TSIO-360-MG1 six-cylinder air-cooled engine

Dimensions: Wingspan 1067m; length 7.06m; height 2.55m; wing area 15.5m²

Weights: Empty 813kg; max take-off 1315kg

Performance: Max speed 406km/h; max cruising speed 371km/h; economical cruising speed at 7010m, 330km/h; stalling speed 113km/h; max rate of climb at sea level 329m/min

Notes: Introduced to the Mooney range in 1985 to replace the Model 231, basically differing in having the TS10-360 engine with a Garrett AiResearch turbocharger.

MOONEY PFM PORSCHE

Description: Business and private owner aircraft

Power plant: One 217hp Porsche PFM.3200 NO3

Dimensions: Wingspan 11m; length 8.2m; height 2.5m, wing area 53.27m²

Weight: Max take-off 1315kg

Performance: Max cruising speed 298km/h at 2400m; service ceiling 5800m; max range 1700km; max endurance 6.7hrs

Notes: Powered by aviation version of Porsche sports car engine. First of type in Australia.

OPTICA SCOUT & SCOUTMASTER

Description: Two-seat light observation aircraft

Power plant: One 260hp Lycoming IO-540-V4ASD six-cylinder air-cooled engine

Dimensions: Wingspan 12m; length 8.16m; height 2.31m; wing area 15.84m²

Weights: Empty 1180kg; max take-off 1540kg

Performance: Max speed 222km/h; cruising speed 191km/h; loiter speed 122km/h; initial rate of climb 280m/min; max range 732km; service ceiling 4875m; endurance at loiter speed 10 hrs

Notes: A development of the Edgley Optica, the Scoutmaster is offered in two versions and is fitted with modern surveillance systems equipment and is aimed at customs services, police patrol work etc. Also known as the Edgley Scoutmaster.

PACIFIC AEROSPACE CRESCO 08-600

Description: Single-seat agricultural monoplane

Power plant: One 600shp Avco Lycoming LTP-101-700A-1 turboprop

Dimensions: Wingspan 12.81m; length 11.06m; height 3.42m; wing area 27.31m²

Weights: Empty 1247kg; max take-off 2925kg

Performance: Max speed at sea level 328km/h; max cruising speed 250km/h; stalling speed 97km/h; max rate of climb at sea level 321m/min; service ceiling 6400m; range with max fuel 865kg

Notes: A development of the Fletcher FU-24 series of agricultural aircraft fitted with a turbine engine and built by Pacific Aerospace in New Zealand. First of the type flown in 1979.

PIPER PA-18 SUPER CUB

Description: Two-seat training monoplane

Power plant: One 150hp Lycoming 0-320 four-cylinder air-cooled engine

Dimensions: Wingspan 10.76m; length 6.91m; height 2.03m; wing area 16.58m²

Weights: Empty 422kg; max take-off 794kg

Performance: Max speed 209km/h; cruising speed 185km/h; initial rate of climb 292m/min; service ceiling 5791m; range 740km

Notes: A development of the Piper Cub, the Super Cub was introduced to the Piper range in 1949 and since then more than 7000 have been built. Has just been placed back into production to meet demand. All metal construction with fabric covering.

PIPER PA-28 WARRIOR

Description: Four-seat cabin monoplane

Power plant: One 160hp Lycoming 0-320-D3G four-cylinder air-cooled engine

Dimensions: Wingspan 10.67m; length 7.25m; height 2.38m; wing area 15.79m²

Weights: Empty 613kg; max take-off 1106kg

Performance: Max speed 235km/h; max cruising speed 233km/h; economical cruising speed 195km/h; initial rate of climb 196m/min; service ceiling 3355m; max range with reserves 1186km

Notes: A development of the Cherokee series, the Warrior was originally fitted with a 150hp engine and in 1977 it received the 160hp unit. Over 5000 examples have been built.

PIPER PA-28 ARCHER

Description: Four-seat cabin monoplane

Power plant: One 180hp Lycoming 0-360-A4M four-cylinder air-cooled engine

Dimensions: Wingspan 10.67m; length 7.25m; height 2.38m; wing area 15.79m²

Weights: Empty 657kg; max take-off 1156kg

Performance: Max speed 239km/h; economical cruising speed 198km/h; initial rate of climb 224m/min; service ceiling 4160m; max range with reserves 1242km

Notes: A development of the original Piper Cherokee, the Archer has been very popular and more than 10,000 have been built.

Fokker 50.

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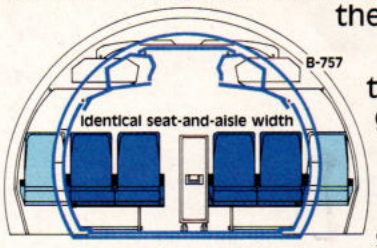

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PIPER PA32 RT LANCE

Description: Six/seven-seat single-engine cabin monoplane

Power plant: One 300hp Lycoming IO-540-K1A5D six-cylinder air-cooled engine

Dimensions: Wingspan 9.99m; length 8.45m; height 2.41m; wing area 16.21m²

Weights: Empty 867kg; max take-off 1633kg

Performance: Max speed 306km/h; max cruising speed 293km/h; range 1618km; max rate of climb 305m/min; service ceiling 4450m

Notes: First of the Lance series flown in August 1974, being a development of the Cherokee Six series but fitted with a retractable undercarriage. Was available with normally aspirated or turbocharged engines. Replaced on the production line by the Saratoga.

PIPER PA-38 TOMAHAWK

Description: Two-seat light training monoplane

Power plant: One 112hp Avco Lycoming 0-235-L2C four-cylinder air-cooled engine

Dimensions: Wingspan 10.36m; length 7.04m; height 2.63m; wing area 11.61m²

Weights: Empty 483kg; max take-off 757kg

Performance: Max speed at sea level 209km/h; cruising speed at 2680m, 202km/h; range at 202km/h, 745km; initial rate of climb 213m/min; service ceiling 3917m

Notes: Designed by Piper Aircraft as a good, all-round training aircraft with emphasis on simplicity of maintenance and with low operating costs. Deliveries commenced in 1978 and over 2500 have been built. Very popular with aero clubs.

PITTS S-1

Description: Single-seat sporting biplane

Power plant: One 180hp Lycoming IO-360-B4A four-cylinder air-cooled engine

Dimensions: Wingspan 5.28m; length 4.71m; wing area 9.15m²

Weight: Empty 326kg; max take-off 522kg

Performance: Max speed 283km/h; max cruising speed 227km/h; max rate of climb at sea level 816m/min; service ceiling 6795m; range 507km

Notes: Designed by Curtis Pitts as a high-performance fully aerobatic biplane. Probably the most well-known aerobatic aircraft in the western world, it has been the type flown by many of the world's leading aerobatic pilots at major aerobatic championships.

PITTS S-2

Description: Two-seat sporting biplane

Power plant: One 200hp Lycoming IO-360 four-cylinder air-cooled engine

Dimensions: Wingspan 6.10m; length 5.41m; height 1.94m; wing area 11.61m²

Weights: Empty 454kg; max take-off 712kg

Performance: Max speed 253km/h; cruising speed 217km/h; stalling speed 93km/h; rate of climb at sea level 548m/min; service ceiling 6125m; range 552km

Notes: A development of the very popular S-1 series but seating two. Wings of wooden construction with fabric covering, whereas the fuselage is of welded steel tube with fabric covering. Over 30 Pitts of both models are registered in Australia.

PZL 104 WILGA

Description: Glider Tug and Parachuting Aircraft

Power plant: One 260hp nine-cylinder radial

Dimensions: Wingspan 11.1m; length 8.1m; height 2.94m; wing area 15.5m²

Weights: empty 430kg; max take-off 1300kg

Performance: Max speed 195km/h; cruising speed 138km/h; service ceiling 4300m; range 680km

Notes: Built by Centrum Naukowan Produkcyjne in Warsaw, Poland. The Wilga is a successful glider tug extensively used throughout the Eastern bloc. All metal construction.

SEABIRD SENTINEL

Description: Two-seat light training and touring aircraft

Power plant: One 90hp Norton Rotary and liquid cooled

Dimensions: Wingspan 10.97m; length 6.24m; wing area 12.54m²

Weights: Empty 294.8kg; max take-off 544kg

Performance: Max speed 186km/h; cruising speed 168km/h; stalling speed 75km/h; range 303km; initial rate of climb 244m/min

Notes: Designed as a light touring and training aircraft and produced at Pialba in Qld. All metal construction. First flight of prototype expected in December 1988 and Australian certification by mid-1989.

SIAI-MARCHETTI SF-260

Description: Four-seat cabin monoplane

Power plant: One 260hp Lycoming 0-540-E4A5 six-cylinder air-cooled engine

Dimensions: Wingspan 8.22m; length 7.01m; height 2.6m; wing area 10.08m²

Weights: Empty 675kg; max take-off 1100kg

Performance: Max speed 370km/h; cruising speed 222km/h; initial rate of climb 548m/min; service ceiling 6513m; range 1689km

Notes: Designed and built in Italy, the first of the type was flown in July 1964. Endowed with high performance, the type has set a number of FAI ratified records for its class. Is used by Sabena and Air France as a trainer; and by a number of air forces in a similar role and as a counter insurgency aircraft.

SUKHOI SU-26M

Description: Single-seat aerobatic monoplane

Power plant: One 360hp M-14P 9-cylinder radial engine

Dimensions: Wingspan 7.8m; length 6.9m; height 2.9m; wing area 11.9m²

Weight: Max take-off 800kg

Performance: Max speed 350km/h; max rate of climb at sea level 1080m/min; service ceiling 4000m; ferry range 800km

Notes: Designed for use by European bloc pilots in aerobatic competitions, the SU-26M is stressed to +11 and -9 G-limits. All metal construction with composite skin panels. Winner of the 1986 and 1987 Men's World Aerobatic Championship.

TRANSAVIA PL-12 SKYFARMER

Description: Single-seat agricultural aircraft

Power plant: One 300hp Lycoming IO-520-D six-cylinder air-cooled engine

Dimensions: Wingspan 12.15m; length 6.4m; height; 2.8m; wing area 23.5m²

Weights: Empty 830kg; max take-off 1723kg

Peformance: Max speed at sea level 208km/h; max cruising speed 188km/h; initial rate of climb 243m/min; range with max fuel 1297km; service ceiling 3200m

Notes: Designed and developed by the Transavia Corporation at Seven Hills in Sydney. Deliveries of production aircraft began in December 1966 and since then more than 120 have been delivered to a variety of countries, including China.

ULTRABAT

Description: Single-seat amateur-built aerobatic aircraft

Power plant: One 65hp water-cooled Bombardier-Rotax 532

Dimensions: Wingspan 6.4m; length 4.9m; height 0.91m; wing area 8.83m²

Weight: Empty 145kg

Performance: Max speed 213km/h; rate of climb 304m/min

Notes: Australian-designed, fully certificated aerobatic aircraft, capable of manoeuvres to the Advanced level.

VICTA AIRTOURER

Description: Two-seat light monoplane

Power plant: One 100hp Rolls-Royce/Continental 0-200A four-cylinder air-cooled engine

Dimensions: Wingspan 7.93m; length 6.33m; height 2.3m; wing area 11.15m²

Weights: Empty 476kg; max take-off 748kg

Performance: Max speed 220km/h; max cruising speed 202km/h; initial rate of climb 206m/min; service ceiling 3962m; max range 1287km

Notes: The first Australian designed and built aircraft to receive type approval, in 1962. In all, 169 of the type were constructed at the Victa complex at Milperra. Due to lack of government support, the design was sold in New Zealand where a further 40 were completed.

Airline

AIRBUS A300B-4

Description: Medium-haul commercial transport

Power plant: Two 51,000lb st General Electric CF6-50C turbofans

Dimensions: Wingspan 44.84m; length 53.62m; height 16.53m; wing area 260m²

Weights: Empty 85,060kg; max take-off 157,500kg

Performance: Max cruising speed at 9185m, 930km/h; economical cruising speed at 9450m, 869km/h; long-range cruising speed at 10,060m, 839km/h; range with max payload 4213km; max range with 21,932kg payload, 6428km

Notes: Designed and built by a consortium involving British, French and German companies, with shares acquired by Spain and the Netherlands. Parts built by each manufacturer and assembled in France. First of type flown in October 1972. Five obtained by Australian Airlines.

ANTONOV AN-124 RUSLAN

Description: Commercial and military heavy-lift transport

Power plant: Four 51,650lb st Lotarev D-18T turbo-fans

Dimensions: Wingspan 73.3m; length 69.1m; height 20.78m

Weight: Max take-off 405,600kg

Performance: Cruising speed 850km/h; range with max load 4500km; max flight range 16,500km

Notes: The largest Soviet aircraft, the Ruslan set a world record in July 1985 by lifting a load of 171,219kg to an altitude of 10,750m. The cargo compartment measures 36m long by 6.4m wide and 4.4m high. Able to operate on unpaved runways. First of type flown in 1982. Flight crew of 6.

BOEING 727-200F

Description: Medium-range commercial airliner

Power plant: Three 14,500lb st Pratt & Whitney JT8D-9 turbofans

Dimensions: Wingspan 32.92m; length 46.69m; height 10.36m; wing area 157.9m²

Weights: Empty 44,235kg; max take-off 94,347kg

Performance: Max speed at 6250m, 999km/h; max cruising speed at 7530m, 964km/h; economical cruising speed at 9145m, 917km/h; range with 11,974kg payload and normal reserves, 4585km

Notes: For some time the most successful jet airliner of all time, with more than 1800 delivered, the number built has only recently been exceeded by its stablemate, the Boeing 737. First of the type flown in February 1963. Used extensively in Australia by both Ansett and Australian Airlines. The V-200F is the freighter version used by Ansett Air Freight.

BOEING 737-300

Description: Short-haul commercial airliner

Power plant: Two 20,000lb st General Electric CFM 56-3-B1 turbofans

Dimensions: Wingspan 28.9m; length 33.4m; height 11.12m; wing area 91.02m²

Weights: Empty 31,561kg; max take-off 61,236kg

Performance: Max cruising speed at 7620m, 899km/h; economical cruising speed at 10,670m, 787km/h; range with max payload and no reserves 4225km; range at economical cruising speed with max fuel and 13,245kg payload 5485km

Notes: The -300 series is a development of the -200 series, featuring a lengthened fuselage and more efficient engines. Now the most successful jet airliner of all time with more than 2000 ordered. In service with Ansett and Australian Airlines.

BOEING 747-300

Description: Long-range commercial airliner

Power plant: Four Pratt & Whitney JT9D-7F turbofans

Dimensions: Wingspan 59.64m; length 70.66m; height 19.33m; wing area 511m²

Weights: Empty 174,134kg; max take-off 377,840kg

Performance: Max speed at 9145m, 982km/h; long range at cruising speed 11,575km; cruising ceiling 13,715m; ferry range 13,520km

Notes: A development of early model 747s, with changes to the upper deck to increase passenger-carrying capacity, increasing capacity from 32 to 69 passengers on the upper deck. In service with Qantas.

BOEING 767-200

Description: Medium-haul commercial airliner

Power plant: Two 47,900lb st General Electric CF6-80A turbofans

Dimensions: Wingspan 47.65m; length 48.5m; height 15.85m; wing area 283.3m²

Weights: Empty 81,856kg; max take-off 136,200kg

Performance: Max cruising speed at 9105m, 937km/h; economical cruising speed at 11,887m, 850km/h; range with 211 passengers 5075km

Notes: First 200 flew in September 1981 at Paine Field, Everett. Five in service with Ansett being Model 277s and seven extended range models in service with Qantas. Three similar aircraft in service with Air New Zealand.

BOEING 767-300

Description: Commercial airliner

Power plant: Two 52,000lb st General Electric CF6-80-C282 turbofans

Dimensions: Wingspan 47.57m; length 54.94m; height 15.85m; wing area 283.3m²

Weights: Empty 80,785kg; max take-off 172,365kg

Performance: Similar to the 767-200

Notes: A development of the earlier Boeing 767 models with a lengthened fuselage to permit seating for 269. In service with Qantas.

BRITISH AEROSPACE BAe 146-100

Description: Commercial airliner

Power plant: Four 6968lb st Avco Lycoming ALF-502 R-5 turbofans

Dimensions: Wingspan 26.34m; length 28.56m; height 8.61m; wing area 77.30m²

Weights: Empty 22,000kg; max take-off 40,597kg

Performance: Max cruising speed at 7925m, 778km/h; economical cruising speed at 9145m, 710km/h; range with max payload 1982km; service ceiling 8839m

Notes: Launched in 1973 as a feeder-jet transport, the type was initially offered as the BAe-146-100 seating 82 and the -200 seating 106. Later the -300 appeared with the fuselage stretched by 3.15m.

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DE HAVILLAND DH114 HERON

Description: Commercial airliner

Power plant: Four 250hp de Havilland Gipsy Queen 30 Mk 2 six-cylinder air-cooled engines

Dimensions: Wingspan 21.8m; length 14.8m; height 4.75m; wing area 46.4m^2

Weights: Empty 3931kg; max take-off 6123kg

Performance: Max cruising speed at 914m, 307km/h; economical cruising speed at 2438m, 295km/h; stalling speed 121km/h; rate of climb at sea level 328m/min; range with 1265kg payload 8047km

Notes: Designed with the emphasis on simplicity, the first Heron flew in May 1950. Production aircraft were fitted with the Gipsy Queen engines but many were later fitted with the more powerful 290hp Lycoming units and most of those surviving in Australia have this engine.

DE HAVILLAND CANADA DASH 8-100

Description: Regional airliner

Power plant: Two 2000shp PWAC PW120 turboprops

Dimensions: Wingspan 25.9m; length 22.25m; height 7.62m; wing area 54.4m^2

Weights: Empty 14,062kg; max take-off 15,649kg

Performance: Max cruising speed 554km/h; max altitude 7620m; range 1019km

Notes: Used in Papua New Guinea and New Zealand; several are on order by Australian regional airlines.

FOKKER F-27 FRIENDSHIP

Description: Commercial airliner

Power plant: Two 2230shp Rolls Royce Dart 532-7 turboprops

Dimensions: Wingspan 29m; length 23.56m; height 8.51m; wing area 70m^2

Weights: Empty 10,295kg; max take-off 20,410kg

Performance: Max cruising speed 486km/h; initial rate of climb 450m/min; service ceiling 9000m; range with max payload 2070km

Notes: One of the most successful airliners in recent years, the Friendship has been sold in considerable numbers to the world's airlines, and more than 60 examples have operated with Australian airlines. First of the type flown in 1955.

FOKKER F-28 FELLOWSHIP

Description: Short-haul airliner

Power plant: Two 9850lb st Rolls Royce Spey 555-15 turbojets

Dimensions: Wingspan 23.58m; length 21.4m; height 8.47m; wing area 76.4m^2

Weights: Empty 16,144kg; max take-off 29,480kg

Performance: (mx. 1000) Max cruising speed at 6400m, 849km/h; economical cruising speed at 7620m, 836km/h; max operating ceiling 10,675m; range with max payload 1538km

Notes: First of the type flown in May 1967. Produced in a number of variants through to the Model 600. Model 1000 has seating for 65. 17 have appeared on the Australian register.

FOKKER F-50

Description: Commercial airliner

Power plant: Two 2150shp Pratt & Whitney PW124 turboprops

Dimensions: Wingspan 29m; length 25.19m; height 8.60m; wing area 70m^2

Weights: Empty 12,383kg; max take-off 18,990kg

Performance: Typical cruising speed 532km/h; typical climb speed 370km/h; max operating altitude 7620m; range with 50 passengers and baggage 1390km

Notes: Basically a development of the Friendship with new technology engines, six-bladed propellers and considerable other re-design. Ordered by the Ansett organisation for use by a number of its subsidiaries, the first arriving in September 1987.

SAAB SF-340

Description: 34-seat commuter airliner

Power plant: Two 1675shp General Electric CT7-5A turboprops

Dimensions: Wingspan 21.44m; length 19.72m; height 6.87m; wing area 41.81m^2

Weights: Empty 7194kg; max take-off 11,793kg

Performance: Max speed at 4570m, 508km/h; max cruising speed at 6096m, 514km/h; long-range cruising speed at 7620m, 396km/h; max range with 34 passengers 1690km; max rate of climb at sea level 548m/min; service ceiling 7620m

Notes: One of a new series of commuter airliners introduced in recent years, the SF-340 is built by Saab-Scania at Linkoping in Sweden. Three have been bought by Kendell Airlines.

XIAN Y7-100 (CHINA)

Description: Regional airliner

Power plant: Two 2650shp XAC WJ5A-1 turboprops

Dimensions: Wingspan 29.2m; length 23.71m; height 8.55m; wing area 74.98m^2

Weights: Empty 14,952kg; max take-off 21,800kg

Performance: Max cruise 484km/h; max altitude 4000m; range 910km

Notes: Re-engineered version of Soviet Antonov An-24, with extensive Western assistance. Initial deliveries of Chinese version in 1984. First Chinese-built aircraft seen in Australia.

Executive/ Commuter

BEECH 200 SUPER KING AIR

Description: Business and executive aircraft

Power plant: Two 850shp Pratt & Whitney PT 6A-41 turboprops

Dimensions: Wingspan 16.61m; length 13.36m; height 4.52m; wing area 28.15m²

Weights: Empty 1735kg; max take-off 5670kg

Performance: Economical cruising speed at 7620m, 503km/h; initial rate of climb 774m/min; max range at 8230m, 2961km; range at economical cruising speed 3495km

Notes: First of the 200 series, King Air flew in October 1972. Certificated to carry up to 15 passengers. Supplied to a number of the world's air forces, as well as to a number of smaller airlines. 30 registered in Australia.

BEECHJET 400

Description: Light business and executive aircraft

Power plant: Two 2625lb st Pratt & Whitney JT15D-4D

Dimensions: Wingspan 13.23m; length 14.73m; height 4.19m; wing area 22.43m²

Weights: Empty 4128kg; max take-off 7362kg

Performance: Max speed 806km/h; normal cruising speed at 11,890m, 750km/h; max range with four passengers and reserves 2840km; service ceiling 12,495m

Notes: Originally developed by Mitsubishi as the MU-300 Diamond, first of the type flew in August 1978. Built in small mumbers until the type became the Beechjet, built in Japan and marketed by Beech.

BRITISH AEROSPACE BAe 125-800

Description: Business and executive transport

Power plant: Two 4300lb st Garrett TFE 731-JR-1H turbofans

Dimensions: Wingspan 15.66m; length 15.59m; height 5.37m; wing area 32.75m²

Weights: Empty 6858kg; max take-off 12,430kg

Performance: Max speed at 8840m, 858km/h; economical cruising speed at 11,900m, 741km/h; initial rate of climb 945m/min; service ceiling 13,100m; range with fuel 5560km

Notes: Designed as a small airliner, the first of the series, known as the DH-125, first flew in August 1962 and since then it has been developed through a number of models and sold in large numbers, particularly in the USA, as a business and executive aircraft.

CANADAIR CHALLENGER 601

Description: Business and executive transport

Power plant: Two 9140lb st General Electric CF34-1A turbofans

Dimensions: Wingspan 19.61m; length 20.85m; height 6.3m; wing area 41.82m²

Weights: Empty 9049kg; max take-off 19,550kg

Performance: Max cruising speed 851km/h; normal cruising speed 819km/h; max operating altitude 12,500m; range with max fuel and five passengers 6208km

Notes: First of the series flown in November 1978, and first production model known as Model 600 with Avco Lycoming engines. The Challenger 601 is the long-range version of the Challenger 600 which was first produced in 1978. This aircraft is under consideration as one of the replacements for the RAAF's VIP fleet.

DASSAULT FALCON 900

Decription: Three-engine executive transport

Power plant: Three 4500lb st Garrett AiResearch TFE731-5A-1C turbofans

Dimensions: Wingspan 19.33m; length 20.21m; height 7.55m; wing area 49.03m²

Weights: Empty 10,615kg; max take-off 20,640kg

Performance: Max cruising speed at 11,890m, 892km/h; range cruise at 11,275m, 797km/h; max rate of climb 1158m/min; stalling speed 152km/h; range with 15 passengers with max fuel and reserves 6780km

Notes: The Falcon 900 first flew in September 1984 and was designed as a three turbofan executive transport capable of travelling long distances non-stop.

DASSAULT FALCON 100

Description: Business and executive aircraft

Power plant: Two 3230lb st Garrett AiResearch TFE731-2

Dimensions: Wingspan 13.08; length 13.85m; height 4.61m; wing area 24.1m²

Weights: Empty 4600kg; max take-off 8300kg

Performance: Max cruising speed at 9145m, 915km/h; cruising speed at 13,716m, 796km/h; range with 4 passengers and 45mins reserve at 13,716m, 3980km

Notes: Formerly known as the Falcon 10, this series was introduced in 1969 as a scaled-down Falcon 20. Able to seat four with a crew of two, the type has been sold in some numbers in the USA.

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GH 2040

DOUGLAS DC-3

Description: Commercial and military transport

Power plant: Two 1200hp Pratt & Whitney R-1830-92 Twin Wasp radial engines

Dimensions: Wingspan 28.96m; length 19.66m; height 5.16m; wing area 91.7m²

Weights: Empty 8030kg; max take-off 12,700kg

Performance: Max speed 346km/h; max cruising speed 312km/h; economical cruising speed at 1829m, 266km/h; initial rate of climb 324m/min; service ceiling 6675m; range with max payload 563km; range with max fuel 2430km

Notes: The most famous and widely used transport aircraft of all time, with more than 10,000 built. First flown in December 1935, it saw extensive service in all theatres of WWII, in the Korean War, and as gunships in the Vietnam war. Large numbers saw service with the RAAF and RAN, with many civil operators in Australia.

LEARJET 35

Description: Business and executive transport

Power plant: Two 3500lb st Garrett AiResearch TPE 731-2 turbofans

Dimensions: Wingspan 12.04m; length 14.83m; height 3.73m; wing area 23.53m²

Weights: Empty 4132kg; max take-off 7711kg

Performance: Max cruising speed 859km/h; economical cruising speed 774km/h; initial rate of climb 1554m/min; service ceiling 12,955m; range with four passengers, max fuel and reserves 4466km

Notes: A larger development of the Learjet 25 series, the 35 was introduced in 1974. One of the growing fleet of executive jets available around the world.

PIPER PA42 CHEYENNE 400LS

Description: Light corporate transport

Power plant: Two 1000shp Garrett TPE331-14A turboprops

Dimensions: Wingspan 14.53m; length 13.23m; height 4.72m; wing area 27.20m²

Weights: Empty 3423kg; max take-off 5466kg

Performance: Max cruising speed at 7165m, 652km/h; initial rate of climb 1036m/min; time to 11,885m, 27mins; service ceiling 12,495m; range at 591km/h with six passengers, 2157m

Notes: Crew of two and seating for up to nine. First of type flown in February 1983. A development of the earlier Cheyenne series with 1645shp flat-rated engines, with a number of design modifications and new propellers.

SCOTTISH AVIATION TWIN PIONEER

Description: Civil and military utility transport

Power plant: Two 520hp Alvis Leonides 128 seven-cylinder radial engines

Dimensions: Wingspan 23.32m; length 13.8m; height 4.17m; wing area 62.24m²

Weights: Empty 4310kg; max take-off 6123kg

Performance: Max speed at 457m, 265km/h; cruising speed at 1524m, 209km/h; initial rate of climb 391m/min; service ceiling 5730m; max range 1307km

Notes: Although aimed at the civil market, most twin Pioneers built were operated by the RAF and the Malayan Air Force. Crew of two and 16 passengers or up to 1542kg of cargo in freight configuration.

Amateur-Built

ACRO SPORT

Description: Single-seat aerobatic biplane

Power plant: One 100hp Continental 0-200 four-cylinder air-cooled engine

Dimensions: Wingspan 5.97m; length 5.33m; height 1.83m; wing area 10.73m²

Weights: Empty 332kg; max take-off 612kg

Performance: Max speed 245km/h; max cruising speed 209km/h; max rate of climb 1067m/min; max range 482km

Notes: Designed by Paul Poberezny, President of the Experimental Aircraft Assoc. in the USA, for construction by inexperienced amateur builders. First of the type flew in January 1972. Wooden construction with fabric covering.

BEDE BD-4

Description: Two-seat sporting and utility monoplane

Power plant: One 150hp Lycoming 0-320 four-cylinder air-cooled engine

Dimensions: Wingspan 7.8m; length 6.52m; height 2.2m; wing area 9.51m²

Weights: Empty 458kg; max take-off 816kg

Performance: Max speed 273km/h; cruising speed 257km/h; stalling speed 101km/h; initial rate of climb 335m/min; range 1287km

Notes: Designed by James Bede in the USA, for amateur construction. May be completed in two-seat or four-seat form, and with tricycle or tail-wheel undercarriage.

BUSHBY MUSTANG II

Description: Two-seat light home-built monoplane

Power plant: One 160hp Lycoming 0-320 four-cylinder air-cooled engine

Dimensions: Wingspan 7.37m; length 5.94m; height 1.6m; wing area 9.02m²

Weights: Empty 420kg; max take-off 680kg

Performance: Max speed 328km/h; max cruising speed at 2285m, 323km/h; max rate of climb at sea level 425m/min; service ceiling 5485m; range 692km

Notes: Designed by Robert Bushby in the USA, the first Mustang II was flown in July 1966 and at least 1000 have been or are being built throughout the world. Construction is all metal.

COLOMBAN MC15 CRICRI (CRICKET)

Description: Single-seat aerobatic aircraft

Power plant: Two 15hp JPX PUL 212D single-cylinder, two-stroke engines

Dimensions: Wingspan 4.9m; length 3.9m; height 1.2m; wing area 3.1m²

Weights: Empty 78kg, max take-off 170kg

Performance: Max speed 220km/h; max cruise 200km/h; max rate of climb 390m/min; service ceiling 5000m; range (with long-range tanks) 900km

Notes: First of type in Australia. Stressed to +9G/-4.5G for aerobatic flight. One of the smallest twin-engine aircraft in the world.

CORBY CJ-1 STARLET

Description: Single-seat light amateur-built monoplane

Power plant: One 49hp four-cylinder Volkswagen conversion

Dimensions: Wingspan 5.64m; length 4.5m; height 1.47m; wing area 6.36m²

Weights: Empty 190kg; max take-off 295kg

Performance: Max speed 217km/h; max cruising speed 198km/h; initial rate of climb 213m/min; service ceiling 4420m

Notes: Designed by John Corby in Sydney, the Starlet won an English design competition in 1964. Since then it has been built by amateur builders in Australia and New Zealand. All-wood construction.

DE BEARN GY201 MINICAB

Description: Two-seat light cabin monoplane

Power Plant: One 85hp four-cylinder Continental engine

Dimensions: Wingspan 7.62m; length 5.54m; height 1.65m; wing area 9.94m²

Weights: Empty 340kg; max take-off 560kg

Performance: Max speed 199km/h; cruising speed 180km/h; initial rate of climb 207m/min; stalling speed 75km/h; range 643km

Notes: Designed in France by Yves Gordon, the Minicab has been built in considerable numbers by amateur constructors around the world. First of the type flew in 1949. Construction is all-wood with fabric covering.

EVANS VP.2 VOLKSPLANE

Description: Two-seat amateur-built monoplane

Power plant: One 72hp Revmaster Model 1831D four-cylinder engine

Dimensions: Wingspan 8.23m; length 5.87m; height 1.56m; wing area 12.08m²

Weights: Empty 290kg; max take-off 471kg

Performance: Max speed 152km/h; cruising speed 120km/h; stalling speed 64km/h; initial rate of climb 122m/min; range 402km

Notes: The Volksplane VP-2 is a two-seat derivative of the VP-1 single-seater designed in the USA by W.S. Evans. Construction is all-wood and a number have been completed by amateur builders in Australia.

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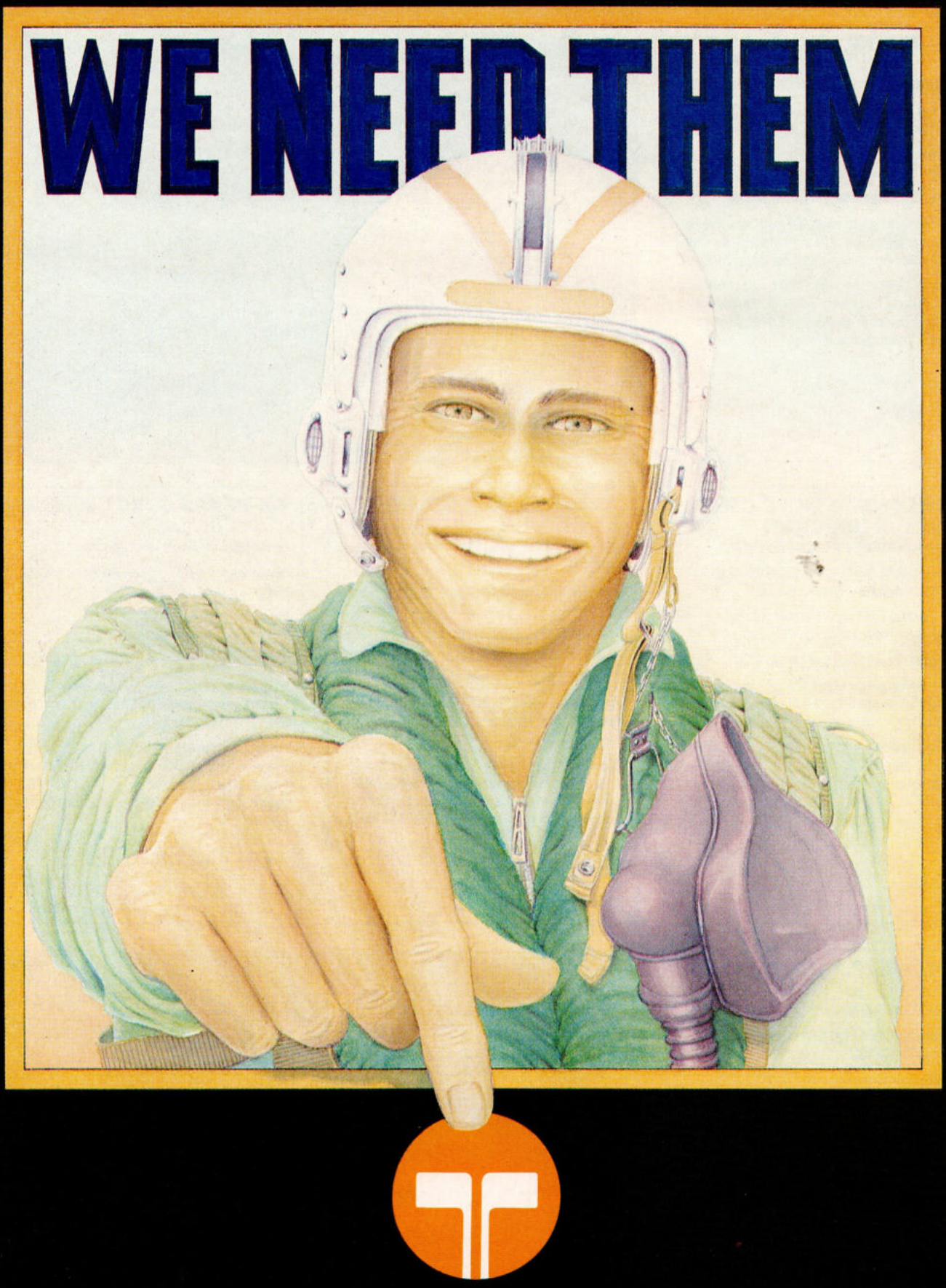

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HEINTZ ZENITH

Description: Two-seat light touring monoplane

Power plant: One 100hp Continental 0-200 four-cylinder air-cooled engine

Dimensions: Wingspan 7m; length 6.3m; height 1.85m; wing area 9.8m²

Weights: Empty 400kg; max take-off 680kg

Performance: Max speed at sea level 233km/h; cruising speed 215km/h; max rate of climb 240m/min; service ceiling 4600m; range 800km

Notes: Designed in France for amateur construction, and first of type flown in March 1970. Plans subsequently marketed by Zenair in Canada. Number of models available, including CH-200 Zenith and CH-300 Tri-Z.

JODEL D-11

Description: Two-seat low-wing light monoplane

Power plant: One 100hp Continental 0-200-A four-cylinder air-cooled engine

Dimensions: Wingspan 8.23m; length 6.71m; wing area 10.96m²

Weights: Empty 408kg; max take-off 680kg

Performance: Max speed 241km/h; cruising speed 209km/h; stalling speed 80km/h; initial rate of climb 305m/min; range 1150km

Notes: The D-11 was designed in France and used extensively in Europe by aero clubs. Of all-wood construction, it can be fitted with engines ranging from 65 to 108hp. 16 appear on the Australian register.

JODEL DR-1050M SKY KING

Description: Three-seat light touring monoplane

Power plant: One 100hp Continental 0-200 four-cylinder air-cooled engine

Dimensions: Wingspan 8.72m; length 6.35m; height 1.83m; wing area 13.6m²

Weights: Empty 399kg; max take-off 778kg

Performance: Max speed 230km/h; max cruising speed at 1981m, 214km/h; initial rate of climb 180m/min; service ceiling 4724m; max range 1158km

Notes: The DR-1050M is a development of the D-11 series to seat three and a number have been built by amateur constructors. Other models in the series include the Sky Prince, Sky Princess and the Sky Queen, all being similar, only varying in minor detail.

K & S SA-102 CAVALIER

Description: Two-seat light touring monoplane

Power plant: One 125hp Lycoming 0-290 four-cylinder air-cooled engine

Dimensions: Wingspan 8.33m; length 6.71m; wing area 10.96m²

Weights: Empty 408kg; max take-off 680kg

Performance: Max speed 241km/h; cruising speed 209km/h; stalling speed 80km/h; initial rate of climb 305m/min; range 1156km

Notes: The Cavalier is a development of the CAB Minicab aimed at the amateur aircraft builder. Of all-wood construction, the first of the type constructed in Australia flew in 1979. Fitted with a tricycle undercarriage.

LASER AEROBATICS AKRO MODEL Z

Description: Single-seat aerobatic monoplane

Power plant: One 200hp Avco Lycoming IO-360 four-cylinder air-cooled engine

Dimensions: Wingspan 7.42m; length 6.20m; height 1.73m; wing area 9.10m²

Weights: Empty 413kg; max take-off 589kg

Performance: Max speed 324km/h; max rate of climb at sea level 915m/min; stalling speed 104km/h; range 556km

Notes: The Akro Model Z is a re-design by Laser Aerobatics of the Stephens Akro, designed in the USA and first flown in 1967. Stressed to +12G and −11G limits. The type is fully aerobatic and is aimed at unlimited aerobatic competitions. Also known as Stephens Akro II.

LUTON LA-5 MAJOR

Description: Two-seat ultra-light monoplane

Power plant: One 65hp Continental A65 four-cylinder air-cooled engine

Dimensions: Wingspan 10.72m; length 7.24m; wing area 15.14m²

Weights: Empty 272kg; max take-off 499kg

Performance: Max speed 169km/h; cruising speed 152km/h; stalling speed 64km/h; initial rate of climb 213m/min; range 483km

Notes: Designed as a low-cost amateur-built aircraft, the first Major was flown in the United Kingdom in 1939. Re-designed in 1960s by Phoenix Aircraft. Dual controls. Folding wings. First completed in Australia VH-EV1.

MONNETT SONERAI II

Description: Two-seat amateur-built sporting monoplane

Power plant: One 70hp four-cylinder Volkswagen conversion

Dimensions: Wingspan 5.69m; length 5.74m; wing area 7.8m²

Weights: Empty 230kg; max take-off 419kg

Performance: Max speed 266km/h; cruising speed 225km/h; max rate of climb 229m/min; range with max fuel 676km

Notes: Designed by John Monnett in 1973 as a successor to the single-seat Sonerai racing aircraft. Plans and kits containing some components available to builders. All-metal construction with fabric covering and fixed tail-wheel undercarriage.

NEICO LANCAIR 200

Description: Two-seat light amateur-built touring monoplane

Power plant: One 100hp Continental 0-200 four-cylinder air-cooled engine

Dimensions: Wingspan 7.16m; length 5.99m; height 1.85m; wing area 7.06m²

Weights: Empty 295kg; max take-off 578kg

Performance: Max speed 343km/h; cruising speed 306km/h; stalling speed 89km/h; max rate of climb 457m/min; service ceiling 6100m; range 1609km

Notes: The Lancair was designed by Lance Neibauer in the USA as a high-performance all-composite aircraft for the amateur constructor, being supplied in kit form. First of the type flew in 1984. Folding wings are standard.

PAZMANY PL-2

Description: Two-seat light cabin monoplane

Power plant: One 125hp Lycoming 0-290 four-cylinder air-cooled engine

Dimensions: Wingspan 8.53m; length 5.99m; height 2.44m; wing area 10.78m²

Weights: Empty 408kg; max take-off 655kg

Performance: Max speed 232km/h; cruising speed 206km/h; stalling speed 87km/h; max rate of climb 456m/min; range 780km

Notes: A development of the PL-1 for amateur construction. 58 supplied to Chinese Nationalist Air Force in Taiwan for training. First of type flown in April 1969. All-metal construction. Kits and plans supplied by Pazmany Aircraft Corp.

PAZMANY PL-4A

Description: Single-seat sporting aircraft

Power plant: One 50hp four-cylinder Volkswagen conversion

Dimensions: Wingspan 8.13m; length 5.04m; height 1.73m; wing area 8.27m²

Weights: Empty 262kg; max take-off 385kg

Performance: Max speed 201km/h; max cruising speed 158km/h; max rate of climb 198m/min; service ceiling 3960m; range 545km

Notes: Designed as easy-to-build low-cost aircraft for amateur construction. First of type flown in July 1972. Available in kit form. All-metal construction, fixed tail-wheel undercarriage. Aerobatic.

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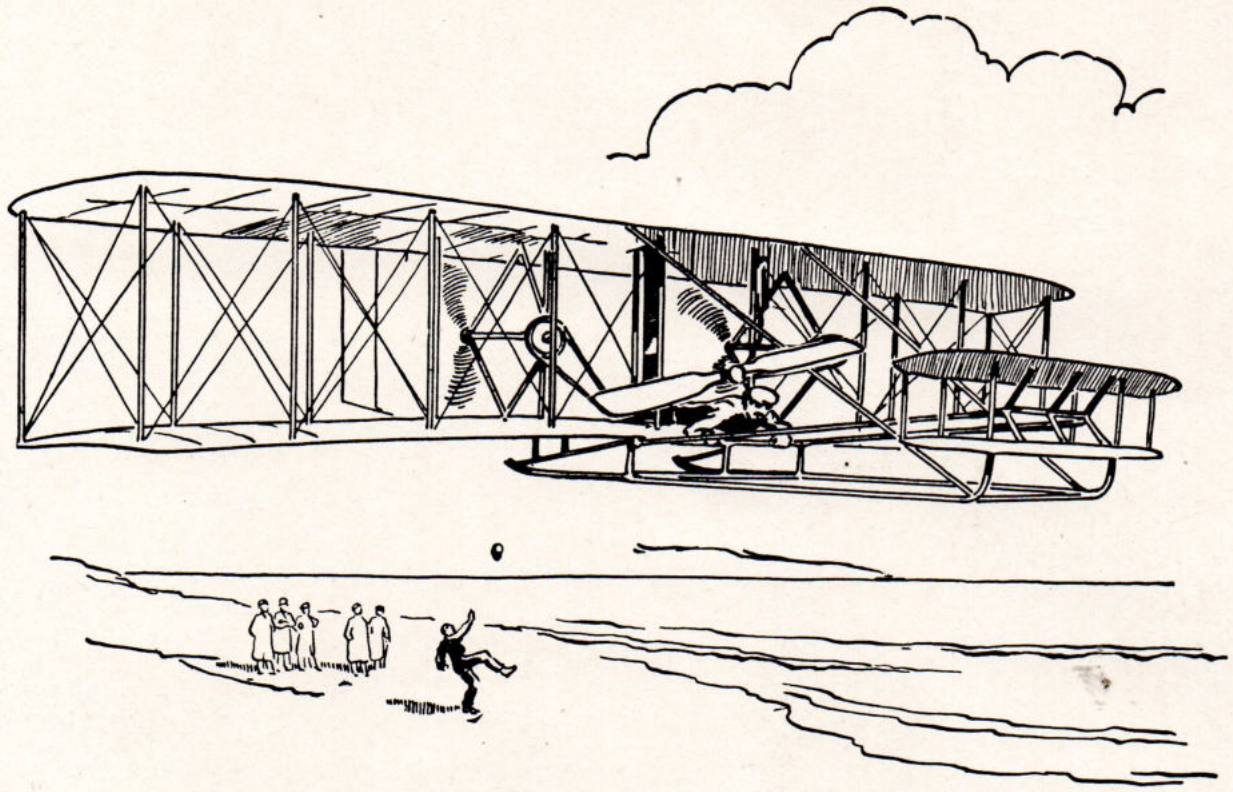

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PIEL EMERAUDE CP-301

Description: Two-seat light cabin monoplane

Power plant: One 90hp Continental C90 four-cylinder air-cooled engine

Dimensions: Wingspan 8.31m; length 6.02m; height 1.85m; wing area 10.85m²

Weights: Empty 380kg; max take-off 639kg

Performance: Max speed 215km/h; max cruising speed 194km/h; initial rate of climb 239m/min; service ceiling 4000m; stalling speed 80km/h; range 949km

Notes: Designed by M. Claude Piel in France, first of the type flew in 1952. Development led to variety of engines up to 150hp being fitted in a number of models. All-wood construction with plywood and fabric covering.

PIETENPOL AIRCAMPER

Description: Two-seat parasol-wing monoplane

Power plant: One 65hp Continental A65 four-cylinder air-cooled engine

Dimensions: Wingspan 8.6m; length 5.4m; height 1.73m

Weights: Empty 285kg; max take-off 394kg

Performance: Max speed 152km/h; cruising speed 128km/h; stalling speed 56km/h; initial rate of climb 243m/min; range 386km

Notes: The Pietenpol series of light aircraft was designed in the USA commencing in 1934 and was very popular with amateur constructors before WWII. Many were built fitted on A-model Ford Motor car engines. A modernised version in recent years known as the Grega Air Camper.

PITTS S-1E SPECIAL

Description: Single-seat sporting biplane

Power plant: One 180hp Lycoming IO-360-B4A four-cylinder air-cooled engine

Dimensions: Wingspan 5.28m; length 4.71m; wing area 9.15m²

Weights: Empty 326kg; max take-off 522kg

Performance: Max speed 283km/h; max cruising speed 227km/h; max rate of climb 816m/min; service ceiling 6795m; range 507km

Notes: Designed by Curtiss Pitts, the S-1 has been one of the most successful sporting biplanes, being used for some years in the World Aerobatic Championships. First of the type flown in September 1944. Metal construction with fabric covering.

QUICKIE I

Description: Single-seat light sports aircraft

Power plant: One 18hp two-cylinder four-stroke Onan Industrial engine

Dimensions: Wingspan 5.08m; length 5.28m; height 1.19m; wing area 4.27m²

Weights: Empty 109kg; max take-off 218kg

Performance: Max speed 202km/h; cruising speed 194km/h; stalling speed 79km/h; rate of climb at sea level 129m/min; service ceiling 3749m; range 917km

Notes: Designed by Bert Ruten, first of the type flew in November 1977. Of fibreglass sandwich construction with low-density rigid foam forming the core material. Cruising at 144km/h, it returns 35km per litre.

RUTAN DEFIANT

Description: Four/five-seat light aircraft

Power plant: One 150hp Avco Lycoming 0-320-E2A (front) and one 0-320-E2B (rear) four-cylinder air-cooled engine

Dimensions: Wingspan 9.57m; wing area 12.36m²

Weights: Empty 762kg; max take-off 1338kg

Performance: Max cruising speed 341km/h; stalling speed 119km/h; max rate of climb 457m/min; max range with reserves 1935km

Notes: First of type flown in June 1978. Sold in kit form for amateur construction. First of type in Australia, VH-001, completed in 1987.

RUTAN LONG EZ

Description: Two-seat sporting aircraft

Power plant: One 115hp Avco Lycoming 0-235 four-cylinder air-cooled engine

Dimensions: Wingspan 8.68m; length 5.12m; height 2.4m; wing area 7.62m²

Weights: Empty 322kg; max take-off 601kg

Performance: Max cruising speed 295km/h; cruising speed 232km/h; stalling speed 80km/h; max rate of climb 411m/min; normal range with reserves 2301km; service ceiling 6705m

Notes: Designed by Elbert Rutan as a two-seat high-performance touring aircraft and a larger development of the VariEze. Composite construction. Over 4000 kits sold worldwide to amateur constructors. Holds a number of world records for its class.

RUTAN VARI EZE

Description: Two-seat sporting aircraft

Power plant: One 100hp Continental 0-200 four-cylinder air-cooled engine

Dimensions: Wingspan 6.81m; length 3.79m; wing area 4.98m²

Weights: Empty 222kg; max take-off 444kg

Performance: Max cruising speed 335km/h; economical cruising speed 233km/h; max rate of climb 549m/min; range 1770km

Notes: Designed by Bert Rutan, first of type flew in May 1975. Later set a number of closed-circuit distance records for its class.

SKYTEK MAVERICK

Description: Single-seat high-performance sporting monoplane

Power plant: One 100hp Continental 0-200 four-cylinder air-cooled engine

Dimensions: Length 2.8m; height 1.8m

Performance: Cruising speed 281km/h; max rate of climb at sea level 365m/min; endurance 4½hrs

Notes: A new Australian entry into light aircraft production, the Maverick is built by Skytek Australia Pty Ltd of Willetton, WA. Aerobatic capability. Composite construction. First of type, VH-JOX, flew in December 1987.

STEEN SKYBOLT

Description: Two-seat sporting biplane

Power plant: One 180hp Lycoming HO-360-BIB four-cylinder air-cooled engine

Dimensions: Wingspan 7.32m; length 5.79m; height 2.13m; wing area 14.2m²

Weights: Empty 490kg; max take-off 762kg

Performance: Max speed 233km/h; cruising speed 209km/h; initial rate of climb 762m/min; service ceiling 5500m; stalling speed 80km/h; range 720km

Notes: Designed by Lamar Steen as a simple aerobatic biplane for amateur construction. First of type flown in October 1970. Engines up to 300hp may be fitted.

STITS SA-3B PLAYBOY

Description: Two-seat light sporting monoplane

Power plant: One 100hp Continental 0-200 four-cylinder air-cooled engine

Dimensions: Wingspan 7.37m; length 5.44m; height 1.52m; wing area 10.03m²

Weights: Empty 363kg; max take-off 657kg

Performance: Max speed 193km/h; cruising speed 161km/h; stalling speed 88km/h; initial rate of climb 213m/min; range 483km

Notes: Designed by Ray Stits in USA and first flown in 1953. Designed as low-cost aerobatic home-built. Wooden wings and steel tube fuselage, fabric covered.

STODDARD HAMILTON GLASAIR

Description: Two-seat high-performance sporting aircraft

Power plant: One 150hp Avco Lycoming 0-320 four-cylinder air-cooled engine

Dimensions: Wingspan 7.09m; length 5.66m; height 2.18m; wing area 7.54m²

Weights: Empty 420kg; max take-off 680kg

Performance: Max speed 362km/h; cruising speed at 2440m, 349km/h; max rate of climb at sea level 518m/min; service ceiling 6100m; max range 1609km

Notes: The first Glasair flew in 1979 and since then a number have been built by amateur constructors. Of composite construction, it is available with a tricycle or tail-wheel undercarriage, and a fixed or retractable undercarriage.

THORP TIII SKY SKOOTER

Description: Two-seat light cab in monoplane

Power plant: One 75hp Lycoming 0-145-B2 four-cylinder air-cooled engine

Dimensions: Wingspan 7.62m; length 5.5m; height 1.55m; wing area 9.77m²

Weights: Empty 326kg; max take-off 567kg

Performance: Max speed 217km/h; cruising speed 193km/h; initial rate of climb 274m/min; stalling speed 69km/h; service ceiling 4572m; range 812km

Notes: Designed by John Thorp in USA and first flown in 1946. All-metal construction. Two aircraft imported to Australia in early 1960s.

THORP T-18C

Description: Two-seat sporting monoplane

Power plant: One 180hp Lycoming 0-360 four-cylinder air-cooled engine

Dimensions: Wingspan 6.35m; length 5.54m; height 1.47m; wing area 8m²

Weights: Empty 408kg; max take-off 683kg

Performance: Max speed 321km/h; max cruising speed 282km/h; max rate of climb at sea level 610m/min; service ceiling 6100m; range with max fuel 805km

Notes: Developed from the TIII for home-built constructors, first of type flew in May 1964. All-metal structure. May be built with folding wings. 20 built in Australia.

VAN SRV-4

Description: Two-seat sporting monoplane

Power plant: One 150hp Avco Lycoming 0-320-EIF four-cylinder air-cooled engine

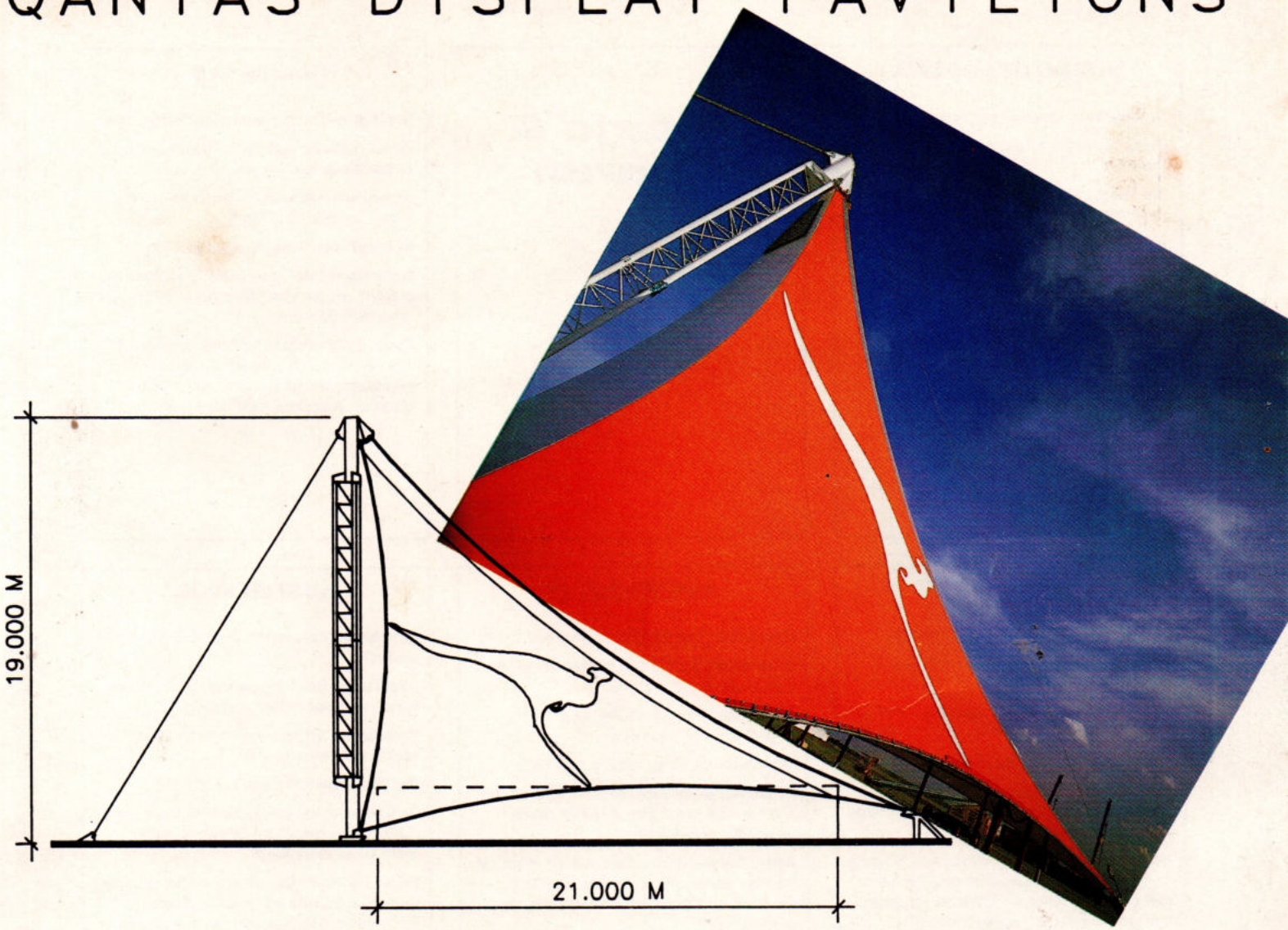
Dimensions: Wingspan 7.01m; length 6.21m; height 1.60m; wing area 10.22m²

Weights: Empty 404kg; max take-off 680kg

Performance: Max speed at sea level 323km/h; economical cruising speed at 2440m, 299km/h; stalling speed 87km/h; max rate of climb 503m/min; service ceiling 5945m; range 1287km

Notes: Designed by Richard Van Grunsven in Oregon, USA, for amateur construction. First of type flown in August 1979. All-metal construction.

QANTAS DISPLAY PAVILIONS



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VIKING DRAGONFLY

Description: Two-seat light sporting aircraft

Power plant: One 45hp four-cylinder Volkswagen conversion

Dimensions: Wingspan 6.71m; length 5.79m; height 1.22m; wing area 4.51m²

Weights: Empty 274kg; max take-off 487kg

Performance: Max speed 270km/h; cruising speed 265km/h; economical cruising speed at 2285m, 225km/h; stalling speed 72km/h; rate of climb at sea level 259m/min; range 804km

Notes: Designed as low-cost, high-performance sporting aircraft. First of type flown in June 1980. Construction of foam/epoxy/fibreglass. Won 1980 EAA outstanding new design award at Oshkosh.

AERO 145

Description: Four/five twin-engine cabin monoplane

Power plant: Two 140hp Walter M332 four-cylinder air-cooled engines

Dimensions: Wingspan 12.25m; length 7.16m; height 2.3m; wing area 17.09m²

Weights: Empty 960kg; max take-off 1500kg

Performance: Max speed 281km/h; cruising speed 249km/h; service ceiling 5900m; range 1698km; initial rate of climb 300m/min

Notes: Designed and built in Czechoslovakia and first of series flown in July 1947. Production terminated in 1961 when 700 completed. Used extensively in eastern Europe.

AERONCA 100

Description: Two-seat light cabin monoplane

Power plant: One 36hp Aeronca E-113C two-cylinder air-cooled engine

Dimensions: Wingspan 11m; length 6m; height 2.4m; wing area 13.2m²

Weights: Empty 258kg; max take-off 455.9kg

Performance: Max speed at sea level 153km/h; cruising speed 140km/h; service ceiling 3657m; range 322km; initial rate of climb 137m/min.

Notes: The Aeronca 100 was introduced in 1934 as a development of the single-seat Aeronca C-2. A small number were registered in Australia pre-war, and the type was also built under licence in the UK.

AUSTER MK. III

Description: Two-seat air-observation-post aircraft

Power plant: One 130hp de Havilland Gipsy Major four-cylinder air-cooled engine

Dimensions: Wingspan 10.97m; length 6.96m; height 2.44m; wing area 17.2m²

Weights: Empty 499kg; max take-off 771kg

Performance: Max speed 209km/h; cruising speed 173km/h; initial rate of climb 289m/min; service ceiling 4572m; range 402 km

Notes: Designed for the air observation role and saw extensive service in Europe in WWII. 56 saw service with RAAF and after retirement 22 registered as private aircraft.

AUSTER MK.5

Description: Three-seat air-observation-post aircraft (warbird)

Power plant: One 130hp Lycoming 0-290-3/1 four-cylinder air-cooled engine

Dimensions: Wingspan 10.97m; length 6.83m; height 2.44m; wing area 17.2m²

Weights: Empty 526kg; max take-off 862kg

Performance: Max speed 209km/h; cruising speed 173km/h; initial rate of climb 289m/min; service ceiling 4572m; range 402km

Notes: The Austers Mks. 4 and 5, also known as The Models G and J, were used in large numbers in Europe during WWII. After being declared obsolete in 1953 large numbers were civilianised.

AUSTER J-IB AIGLET and J-IN ALPHA

Description: Three-seat cabin monoplane

Power plant: One 130hp de Havilland Gipsy Major I four-cylinder air-cooled engine

Dimensions: Wingspan 10.97m; length 7.22m; height 1.98m; wing area 17.2m²

Weights: Empty 554kg; max take-off 907kg

Performance: Max speed 202km/h; cruising speed 169km/h; initial rate of climb 274m/min; ceiling 5486m; range 354km

Notes: Introduced to the Auster range in 1950 and 86 were built, 30 of these being assembled and sold at Bankstown, NSW.

AUSTER J-5G AUTOCAR

Description: Four-seat cabin monoplane

Power plant: One 155hp Blackburn Cirrus Major 3 four-cylinder air-cooled engine

Dimensions: Wingspan 10.97m; length 7.06m; height 2.3m; wing area 17.2m²

Weights: Empty 635kg; max take-off 1085kg

Performance: Max speed 186km/h; cruising speed 161km/h; stalling speed 54km/h; initial rate of climb 160m/min; service ceiling 3353m; range 804km

Notes: The Autocar was introduced in 1949 and is a development of the Autocrat to seat four. Various models produced, mainly varying in type of engine fitted.

AVRO 504K

Description: Two-three seat basic training biplane (warbird)

Power plant: One 130hp Clerget rotary engine

Dimensions: Wingspan 11m; length 9m; height 3.2m; wing area 30.66m²

Weights: Empty 558kg; max take-off 829kg

Performance: Max speed 153km/h; cruising speed 120km/h; initial rate of climb 213m/min; ceiling 4877m; range 362km

Notes: The most famous training aircraft of all time in 1913, the 504 series was built by a number of manufacturers in a number of sub-types. Several were used by the Central Flying School at Point Cook during WWI and a number were built in Australia.

BEAGLE A61/2 TERRIER

Description: Three-seat light cabin monoplane

Power plant: One 145hp de Havilland Gipsy Major 10 mk. 1-1 four-cylinder air-cooled engine

Dimensions: Wingspan 11m; length 7.09m; height 2.7m; wing area 17.09m²

Weights: Empty 742kg; max take-off 1066kg

Performance: Max speed 198km/h; cruising speed 177km/h; initial rate of climb 247m/min; service ceiling 4267m; range 619km

Notes: The Terrier was a re-manufactured Auster Mk.6, a number of which were retired by the British Army in 1960. Two versions were built, one for touring and the other for glider towing.

BEECH 17

Description: Four-seat cabin biplane

Power plant: One 450hp Pratt & Whitney R-985-An-1 Wasp Junior nine-cylinder radial engine

Dimensions: Wingspan 9.75m; length 7.85m; height 2.74m; wing area 27.5m²

Weights: Empty 1165kg; max take-off 1905kg

Performance: Max speed 341km/h; cruising speed 325km/h; landing speed 80km/h; initial rate of climb 457m/min; service ceiling 7010m; range 1351 km

Notes: The Model 17 was the first aircraft produced by Beech Aircraft Corp. The first aircraft flew in 1932. Produced with a variety of engines ranging from 225hp to 690hp. Used extensively in WWII as a communications aircraft.

BEECH 18

Description: Light feeder-liner and executive aircraft (warbird)

Power plant: Two 450hp Pratt & Whitney R-985-AN-B5 nine-cylinder radial engines

Dimensions: Wingspan 14.5m; length 10.4m; height 2.8m; wing area 32.4m²

Weights: Empty 2624kg; max take-off 4082kg

Performance: Max speed 362km/h; max cruising speed 339km/h; initial rate of climb 362m/min; service ceiling 7925m; max range 1931km

Notes: The Beech 18 saw extensive service with the US military services during WWII as a communications aircraft, utility aircraft and in various training roles. Continued in production in the 1940s for civil use.

BOEING-STEARMAN PT-17

Description: Two-seat primary training biplane (warbird)

Power plant: One 225hp Lycoming R-680-17 nine-cylinder radial engine

Dimensions: Wingspan 9.8m; length 7.3m; height 2.8m; wing area 27.6m²

Weights: Empty 878kg; max take-off 1232kg

Performance: Max speed 190km/h; cruising speed 170km/h; initial rate of climb 256m/min; service ceiling 3414m; range 813km

Notes: Designed by Stearman Aircraft Co., which later became a subsidiary of Boeing. Known as the Stearman or Kaydet, the type was the standard primary trainer of the US services during WWII and 8584 examples were built.

BRISTOL F-2B FIGHTER REPLICA

Description: Fighter biplane (warbird)

Power plant: One 230hp Continental IO-520 six-cylinder air-cooled engine

Dimensions: Wingspan 12.01m; length 7.95m; height 3.07m; wing area 37.81m²

Notes: The Bristol Fighter saw service during WWI and later a number were converted for commercial use and became known as the Bristol Tourer. Two were built for a television series and one of these has been converted to represent a Bristol Fighter.

CAC WACKETT

Description: Two-seat basic trainer (warbird)

Power plant: One 175hp Warner Super Scarab seven-cylinder radial engine

Dimensions: Wingspan 11.3m; length 7.9m; height 2.06m; wing area 17.1m²

Weights: Empty 864kg; max take-off 1175kg

Performance: Max speed 177km/h; cruising speed 156km/h; initial rate of climb 213m/min; service ceiling 4877m

Notes: Designed by Sir Lawrence Wackett and built by Commonwealth Aircraft Corp. at Fishermen's Bend as an intermediate trainer to take students from the Tiger Moth to the Wirraway. All metal construction fuselage with fabric covering; wooden wing with plywood covering. 202 aircraft built.

CAC WIRRAWAY

Description: Two-seat basic trainer (warbird)

Power plant: One 600hp Pratt & Whitney S1H1-G Wasp nine-cylinder air-cooled radial engine

Dimensions: Wingspan 13.1m; length 8.3m; height 3.7m; wing area 23.76m²

Weights: Empty 1803kg; Max take-off 2881kg

Performance: Max speed 329km/h; cruising speed 293km/h; initial rate of climb 594m/min; service ceiling 7010m; range 1159km

Notes: The Wirraway was a development of a North American design. Placed in production by Commonwealth Aircraft Corp., 755 were built in Melbourne. The first type flew in March 1939. One, flown by Flying Officer J.S. Archer and Sergeant J. L. Coulston, shot down a Mitsubishi Zero near Gona in December 1942.

CAC MUSTANG

Description: Single-seat fighter monoplane (warbird)

Power plant: One 1650hp Packard Merlin V-1650-3 Vee-twelve-cylinder liquid-cooled engine

Dimensions: Wingspan 11.3m; length 9.84m; height 3.7m; wing area 21.65m²

Weights: Empty 3232kg; max take-off 5262kg

Performance: Max speed at 1524m, 635km/h; initial rate of climb 1059m/min; service ceiling 12,771m; range 2092km

Notes: The Mustang was licence built by Commonwealth Aircraft Corp., at Fishermen's Bend, first aircraft being delivered to the RAAF in June 1945. In all 15,576 Mustangs built in USA and Australia. A number have been converted to civil use.

CAC CERES

Description: Single-seat agricultural monoplane

Power plant: One 600hp Pratt & Whitney R1340-S3H1-G Wasp nine-cylinder radial engine

Dimensions: Wingspan 14.3m; length 9.36m

Weights: Empty 2030kg; max take-off 3130kg

Performance: Max cruising speed 194km/h; normal operating speed 178km/h; initial rate of climb 221m/min; ferry range 833km

Notes: The Ceres was developed from the WWII Wirraway trainer for agricultural work. First of the type flew in 1958 and 20 were built. The stainless steel hopper had a capacity of 3.43m³.

CESSNA C37 AIRMASTER

Description: Four-seat cabin touring monoplane

Power plant: One 145hp Warner Super Scarab seven-cylinder radial engine

Dimensions: Wingspan 10.41m; length 7.52m; height 2.13m; wing area 16.82m²

Weights: Empty 626kg; max take-off 1111kg

Performance: Max speed 265km/h; cruising speed 243km/h; initial rate of climb 304m/min; service ceiling 5486m; range 1263km

Notes: The Airmaster series was introduced by Cessna in 1935 at the company's Wichita plant and was produced in two models, the C-34 and C-37. 41 of the former were built and 46 of the latter. Fuselage of metal tube with fabric covering; wooden wing with plywood and fabric covering.

CHRISLEA CH-4 SKYJEEP

Description: Light touring monoplane

Power plant: One 155hp Blackburn Cirrus Major 3 four-cylinder air-cooled engine

Dimensions: Wingspan 10.97m; length 6.55m; height 2.36m; wing area 16.44m²

Weights: Empty 612kg; max take-off 1066kg

Performance: Max speed 202km/h; cruising speed 180km/h; initial rate of climb 228m/min; range 643km

Notes: Designed and built by Chrislea Aircraft Co. Ltd in Heston, UK, and first of type flew in September 1946. Two models available, CH-3 Super Ace (28 built) and CH-4 Skyjeep (five built).

COMPER CLA-7 SWIFT

Description: Single-seat sporting monoplane

Power plant: One 120hp de Havilland Gipsy 3 four-cylinder air-cooled engine

Dimensions: Wingspan 7.32m; length 5.6m; height 1.61m; wing area 8.36m²

Weights: Empty 276kg; max take-off 512kg

Performance: Max speed 261km/h; cruising speed 225km/h; initial rate of climb 426m/min; ceiling 6096m; range 643km

Notes: Designed by Flight Lieutenant Nicholas Comper as a high-performance sporting aircraft and 42 were built. One flown to Australia in 9 days 2 hrs 20 mins by C.J. Butler, founder of Butler Air Transport.

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CZL LD-40 META SOKOL

Description: Four-seat cabin monoplane

Power plant: One 140hp Walter M-332 four-cylinder air-cooled engine

Dimensions: Wingspan 10.3m; length 7.56m; height 2.46m; wing area 14.5m²

Weights: Empty 534kg; max take-off 933kg

Performance: Max speed at sea level 236km/h; cruising speed 204km/h; initial rate of climb 269m/min; service ceiling 4998m; range 849km

Notes: Designed and built in Czechoslovakia as a light touring aircraft, first of the LD-40 series flying in 1954. Nine examples were imported to Australia.

DE HAVILLAND DH9

Description: Commercial transport biplane (warbird)

Power plant: One 240hp Siddeley Puma engine

Dimensions: Wingspan 9.87m; length 9.3m; height 3.4m; wing area 40.32m²

Weights: Empty 1011kg; max take-off 1769kg

Performance: Max speed 177km/h; initial rate of climb 198m/min; service ceiling 4724m; range 4 hours

Notes: Designed in 1916 by Geoffrey de Havilland as a bomber but best remembered for its civilian use, fitted with a variety of engines. One aircraft in Australia was flown from the UK in 206 days in 1920 by Parer and McIntosh.

DE HAVILLAND DH60G GYPSY MOTH

Description: Two-seat training biplane

Power plant: One 100hp de Havilland Gipsy 1 four-cylinder air-cooled engine

Dimensions: Wingspan 9m; length 7.3m; height 2.7m; wing area 22.6m²

Weights: Empty 417kg; max take-off 748kg

Performance: Max speed 164km/h; cruising speed 136km/h; initial rate of climb 152m/min; service ceiling 4419m; range 515km

Notes: Constructed at Stag Lane and built in large numbers for training duties, as well as being built under licence in the USA, France and Australia. Fitted with a variety of engines. Made a number of record flights. 122 used by RAAF.

DE HAVILLAND DH82 TIGER MOTH

Description: Two-seat training biplane

Power plant: One 130hp de Havilland Gipsy Major I four-cylinder air-cooled engine

Dimensions: Wingspan 8.94m; length 7.3m; height 2.7m; wing area 22.2m²

Weights: Empty 506kg; max take-off 828kg

Performance: Max speed at sea level 175km/h; cruising speed 145km/h; initial rate of climb 205km/h; service ceiling 4153m; range 458km

Notes: Probably the most famous training aircraft of all time and built in vast numbers for wartime training. Also built in Canada and Australia. 1085 built at Bankstown. Saw extensive service with training units of RAAF.

DE HAVILLAND DH84 DRAGON

Description: Light twin-engine commercial biplane

Power plant: Two 130hp de Havilland Gipsy Major I four-cylinder air-cooled engines

Dimensions: Wingspan 14.4m; length 10.5m; height 3.07m

Weights: Empty 1082kg; max take-off 2041kg

Performance: Max speed at sea level 215km/h; cruising speed at 305m, 183km/h; initial rate of climb 172m/min; range with full payload 4419km

Notes: Introduced to the de Havilland range in 1933 as a light commercial airliner. 87 built at Bankstown for RAAF and used in communications and navigation trainer role. 53 saw civil use in Australia.

DE HAVILLAND DH87 HORNET MOTH

Description: Two-seat touring biplane

Power plant: One 130hp de Havilland Gipsy Major I four-cylinder air-cooled engine

Dimensions: Wingspan 9.73m; length 7.61m; height 2.01m; wing area 22.72m²

Weights: Empty 563kg; max take-off 907kg

Performance: Max speed 199km/h; cruising speed 169km/h; service ceiling 4511m; initial rate of climb 210m/min; max range 998km

Notes: Built in 1937 as replacement for DH60 series. 165 aircraft built, of which 12 were imported to Australia.

DE HAVILLAND DH94 MOTH MINOR

Description: Two-seat training monoplane

Power plant: One 90hp de Havilland Gipsy Minor four-cylinder air-cooled engine

Dimensions: Wingspan 11.15m; length 7.44m; height 1.93m; wing area 15.05m²

Weights: Empty 446kg; max take-off 703kg

Performance: Max speed 190km/h; crossing speed 161km/h; initial rate of climb 189m/min; service ceiling 5029m; range 483km

Notes: Introduced in 1937. About 100 built in UK before production stopped because required for war effort and transferred to Australia where 42 were built for RAAF. 13 later placed on civil register.

DE HAVILLAND DH104 DOVE

Description: Eight passenger commuter airliner and charter aircraft

Power plant: Two 380hp de Havilland Gipsy Queen 70-2 six-cylinder air-cooled engines

Dimensions: Wingspan 17.37m; length 12m; height 4.06m; wing area 31.12m²

Weights: Empty 2597kg; max take-off 3991kg

Performance: Max speed 338km/h; cruising speed 288km/h; initial rate of climb 280m/min; service ceiling 6096m; range 1722km

Notes: First of type flown in September 1945 and 542 aircraft built. 20 registered in Australia over the years and a number used by Northern Territory Medical Service.

DE HAVILLAND DH115 VAMPIRE T.35

Description: Two-seat advanced military trainer (warbird)

Power plant: One 3500lb st de Havilland Goblin 35 centrifugal-type turbojet

Dimension: Wingspan 11.6m; length 10.5m; height 1.9m; wing area 24.34m²

Weights: Empty 2347kg; max take-off 5057kg

Performance: Max speed at sea level 883km/h; max speed at 12,192m, 865km/h; initial rate of climb 1371m/min; range at 6096m and 483km/h, 1002km

Notes: Designed as a jet trainer for the RAAF. Sold to a number of air forces around the world and licence built in India and Australia. Served for some years with the RAAF and RAN.

DE HAVILLAND AUSTRALIA DHA3 DROVER

Description: Three-engine commercial monoplane

Power plant: Three 180hp Lycoming 0-360-AIA four-cylinder air-cooled engines

Dimensions: Wingspan 17.38m; length 11m; height 3m; wing area 30.2m²

Weights: Empty 1860kg; max take-off 2948kg

Performance: Max speed at 1524m, 225km/h; rate of climb at sea level 244m/min; cruising speed 201km/h; range 804km

Notes: Designed in the 1940s by the Australian section of de Havilland as a light but sturdy aircraft capable of carrying freight and passengers. 20 aircraft built at Bankstown. Operators included Qantas, TAA and Royal Flying Doctor Service at Broken Hill.

DE HAVILLAND CANADA DHC-1 CHIPMUNK

Description: Two-seat training monoplane

Power plant: One 145hp de Havilland Gipsy Major 10 Mk 2 four-cylinder air-cooled engine

Dimensions: Wingspan 10.47m; length 7.82m; height 2.13m; wing area 15.98m²

Weights: Empty 655kg; max take-off 990kg

Performance: Max speed at sea level 220km/h; cruising speed 191km/h; service ceiling 5000m; range at 1524m and 186km/h, 470km

Notes: Designed in Canada but production undertaken in Great Britain, Canada and Portugal. Used by the RAF and a number used by aero clubs around Australia. More than 90 have appeared on Australian register.

FAIRCHILD F-24

Description: Three/four-seat cabin monoplane

Power plant: One 165hp Ranger 6-410-B1 six-cylinder air-cooled engine

Dimensions: Wingspan 11.09m; length 7.88m; height 2.33m; wing area 17.96m²

Weights: Empty 748kg; max take-off 1162kg

Performance: Max speed at sea level 217km/h; cruising speed 201km/h; initial rate of climb 231m/min; service ceiling 4572m; range 917km

Notes: First of the type flew in 1935. Produced in two main versions, the 24R with the in-line Ranger engine and the 24W with the Warner Super Scarab radial engine. Used extensively by USAAC, RAF, RAAF and other services as communications and utility transport in WWII.

FIAT G59-4B

Description: Two-seat advanced military trainer (warbird)

Power plant: One 1400hp Rolls-Royce Merlin 500/20 12-cylinder Vee liquid-cooled engine

Dimensions: Wingspan 11.58m; length 9.47m; height 3.68m; wing area 29.91m²

Weights: Empty 2850kg; max take-off 3460kg

Performance: Max speed 593km/h; cruising speed 460km/h; climb to 7000m, 8 minutes; service ceiling 11,500m; range 1420km

Notes: First of type flown in 1947. Built in substantial numbers in Italy in single-seat and two-seat variants for high-performance training. Supplied to Italian, Syrian, Egyptian and Argentinian air forces.

FOKKER FVII/3M REPLICA

Description: Replica of commercial transport

Power plant: Three 300hp Jacobs radial engines

Dimensions: Wingspan 22.1m; length 14.3m; wing area 69m²

Weights: Empty 2145kg; max take-off 3592kg

Performance: Max speed 195km/h; cruising speed 160km/h; service ceiling 4700m; normal range 885km; max range 6700km

Notes: This is the replica of probably the most famous aircraft in Australia. The original, the Southern Cross, flown by Sir Charles Kingsford Smith, is housed at Eagle Farm airport in Brisbane. This replica has been built in Adelaide for display purposes.

HAWKER SEA FURY II

Description: Single-seat fighter bomber (warbird)

Power plant: One 2550hp Bristol Centaurus 18-cylinder radial engine

Dimensions: Wingspan 11.7m; length 10.6m; height 4.6m; wing area 26m²

Weights: Empty 4191kg; max take-off 5602kg

Performance: Max speed at 5486m, 740km/h; initial rate of climb 1316m/min; range 1126km; range with two 409 litre drop tanks, 1674km; time to climb to 6095m, 5.7 minutes; stalling speed 167km/h

Notes: The last piston-engine fighter bomber to be manufactured in quantity in the UK. Total of 615 were built, with 101 being used by RAN. Operated from HMAS Sydney and naval air station at Nowra.

LOCKHEED SP-2H NEPTUNE

Description: Maritime reconnaissance bomber (warbird)

Power plant: Two 3500hp Wright R-3350-32W 18-cylinder turbo-compound engines and two 3800lb st Westinghouse J-34-WE-34 turbo-jets

Dimensions: Wingspan 31.65m; length 27.94m; height 8.94m; wing area 92.9m²

Weights: Empty 21,540kg; max take-off 34,276kg

Performance: Max speed 573km/h; with piston engines only 490km/h; service ceiling 6705m; patrol speed 278-333km/h; max range 6196km

Notes: Maritime patrol bomber developed by Lockheed for US Navy and built in number of models and supplied to various countries. Served with Nos. 10 and 11 Squadrons RAAF from 1951 until replaced by Lockheed Orion.

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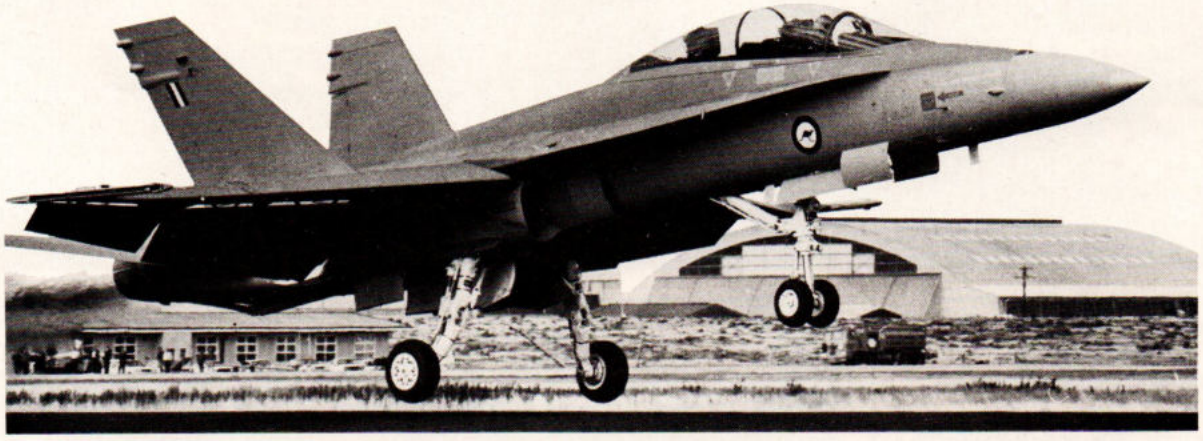

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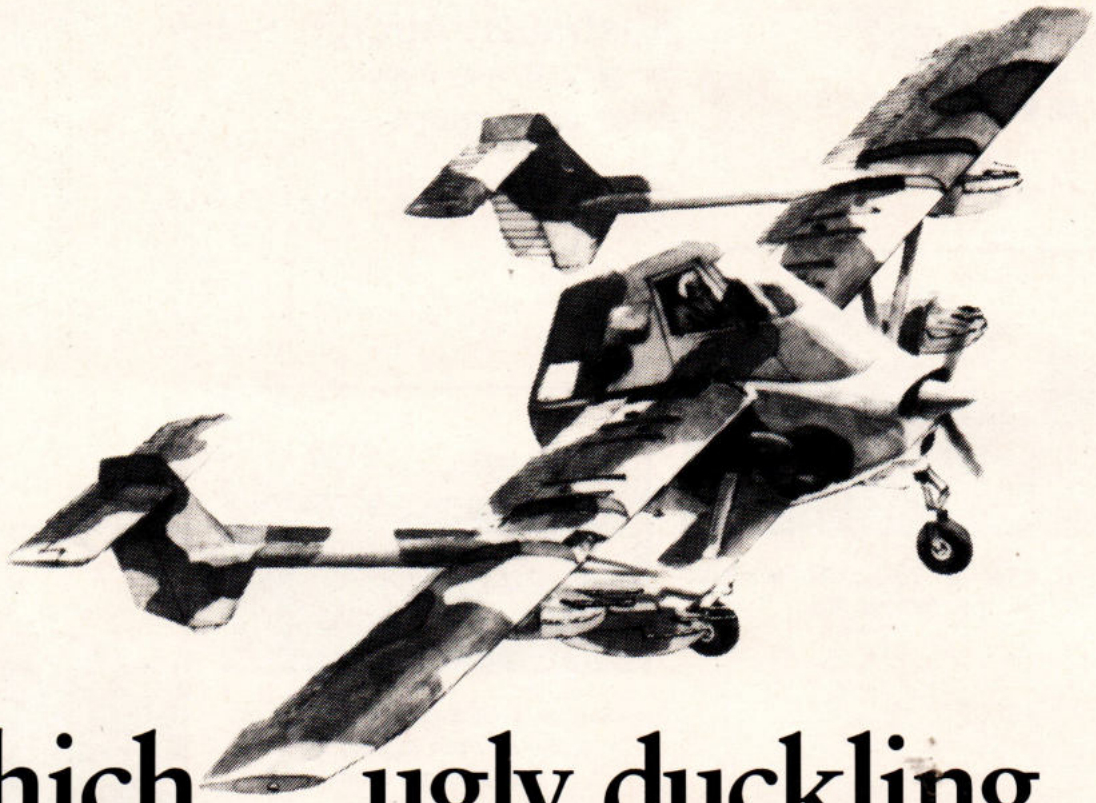

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LUSCOMBE 8A

Description: Light touring monoplane

Power plant: One 65hp Continental A65 four-cylinder air-cooled engine

Dimensions: Wingspan 10.7m; length 6m; height 1.8m; wing area 13m²

Weights: Empty 301kg; max take-off 544kg

Performance: Max speed 185km/h; cruising speed 164km/h; stalling speed 61km/h; initial rate of climb 274m/min; service ceiling 4572m; range 595km

Notes: First of series introduced in 1937 and built in substantial numbers in the USA. Small number imported to Australia in recent years.

MESSERSCHMITT BF109

Description: Single-seat fighter (warbird)

Power plant: One 1475hp Daimler Benz DB605A-1 12-cylinder Vee liquid-cooled engine

Dimensions: Wingspan 9.92m; length 9.04m; height 2.6m; wing area 16.2m²

Weights: Empty 2676kg; max take-off 3152kg

Performance: Max speed at 7000m, 622km/h; time to climb to 5791m, 6 minutes; service ceiling 11,734m; range at 530km/h and 5791m, 724km

Notes: This is a full-scale non-flying replica of the most important Luftwaffe fighter of WWII, with more than 33,000 examples produced. Fought in the Battle of Britain against the RAF's Spitfires and Hurricanes.

MITSUBISHI A6M2 ZERO

Description: Single-seat fighter and fighter bomber (warbird)

Power plant: One 925hp Nakajima Sakae 12 14-cylinder radial engine

Dimensions: Wingspan 12m; length 9m; height 3.5m; wing area 22.4m²

Weights: Empty 1680kg; max take-off 2410kg

Performance: Max speed at 5050m, 534km/h; cruising speed at 3999m, 333km/h; time to climb to 6000m, 7 mins 27 secs; initial rate of climb 1377m/min; service ceiling 10.299m

Notes: The most famous Japanese fighter of WWII, a number of which were seen over Darwin and Broome during attacks. One has been restored by staff at RAAF Wagga Wagga for Australian War Memorial.

LET L-200A MORAVA

Description: Four/five-seat twin-engine cabin monoplane

Power plant: Two 210hp Walter M337 six-cylinder air-cooled engines

Dimensions: Wingspan 12.3m; length 8.6m; height 2.2m; wing area 13.6m²

Weights: Empty 1363kg; max take-off 1950kg

Performance: Max speed at 1829m, 305km/h; max cruising speed 293km/h; economical cruising speed 256km/h; max range 1770km; initial rate of climb 350m/min; service ceiling 6200m

Notes: Designed and built in Czechoslovakia as a successor to the Aero 145 series. First of type flown in April 1957. Large number used in the Soviet Union. One imported to Australia in 1962.

NORTH AMERICAN AT-6 HARVARD

Description: Two-seat advanced training monoplane (warbird)

Power plant: One 550hp Pratt & Whitney R-1340-AN-1 nine-cylinder radial engine

Dimensions: Wingspan 12.81m; length 8.84m; height 3.57m; wing area 23.57m²

Weights: Empty 1937kg; max take-off 2548kg

Performance: Max speed at 1524m, 341km/h; cruising speed 235km/h; normal range 1400km; initial rate of climb 500m/min; service ceiling 7544m

Notes: Used to train thousands of pilots for active service in WWII and over 15,000 built. Saw service with large number of air forces around the world. A number have been imported in recent years, for private use, mostly ex RNZAF.

NORTH AMERICAN T-28B TROJAN

Description: Two-seat basic military trainer (warbird)

Power plant: One 800hp Wright R-1300-1 radial engine

Dimensions: Wingspan 12.38m; length 10m; height 3.8m; wing area 25.1m²

Weights: Empty 2958kg; max take-off 3641kg

Performance: Max speed at 1798m, 455km/h; cruising speed 305km/h; initial rate of climb 570m/min; service ceiling 7315m; range 1689km

Notes: Designed as a replacement for the T-6 Harvard as standard trainer for the US services. Particularly successful in this role, and was developed into counter-insurgency aircraft, seeing some service in Vietnam.

PIPER J-3 CUB

Description: Two-seat light cabin monoplane (warbird)

Power plant: One 65hp Continental A-65 four-cylinder air-cooled engine

Dimensions: Wingspan 10.7m; length 6.82m; height 2.03m; wing area 16.58m²

Weights: Empty 331kg; max take-off 553kg

Performance: Max speed 161km/h; cruising speed 140km/h; initial rate of climb 156m/min; service ceiling 4419m; range 483km

Notes: Appeared in 1936 as a simple two-seat training monoplane and has remained in almost continuous production since that time, now being produced as the Super Cub. Also produced for the US Army as the L-4 observation aircraft during WWII.

PIPER PA-20 PACER

Description: Two-seat cabin monoplane (warbird)

Power plant: One 135hp Lycoming 0-290-D2 four-cylinder air-cooled engine

Dimensions: Wingspan 8.94m; length 6.2m; height 1.9m; wing area 13.7m²

Weights: Empty 458kg; max take-off 884kg

Performance: Max speed 223km/h; cruising speed 201km/h; stalling speed 77km/h; rate of climb 189m/min; service ceiling 4572m; range 933km

Notes: Introduced to the Piper range in 1949, it became available with either the 115hp or 125hp Lycoming engines. Subsequently replaced on the production line by the PA-22, Tri-Pacer, which was similar but had a tricycle under-carriage in lieu of the failwheel.

REPLICA PLANS SE-5a REPLICA

Description: Single-seat sporting biplane (warbird)

Power plant: One 85hp Continental C-85 four-cylinder air-cooled engine

Dimensions: Wingspan 6.96m; length 5.5m; height 2.18m; wing area 13.01m²

Weights: Empty 358kg; max take-off 499kg

Performance: Max speed at sea level 145km/h; max cruising speed 137km/h; max rate of climb at sea level 152m/min; stalling speed 56km/h; range 402km

Notes: This is a replica of the famous WWI fighter re-designed to incorporate modern manufacturing techniques and a modern engine.

RYAN STM

Description: Two-seat training monoplane (warbird)

Power plant: One 150hp Menasoo C45 six-cylinder air-cooled engine

Dimensions: Wingspan 9.12m; length 6.92m; height 2.11m; wing area 11.52m²

Weights: Empty 478kg; max take-off 771kg

Performance: Max speed 257km/h; cruising speed at 914m, 217km/h; stalling speed 67km/h; service ceiling 6400m; rate of climb 426m/min; range 603km

Notes: Built by Ryan Aeronautical Company. First of type flew in 1934. 37 were supplied to the Netherlands' East Indies Air Force but were evacuated to Australia during the war and saw service with RAAF.

SAAB 91C SAFIR

Description: Four-seat cabin monoplane

Power plant: One 180hp Lycoming 0-360-AIA four-cylinder air-cooled engine

Dimensions: Wingspan 10.59m; length 8.03m; height 2.2m; wing area 13.6m²

Weights: Empty 745kg; max take-off 1215kg

Performance: Max speed at sea level 270km/h; economical cruising speed 225km/h; initial rate of climb 300m/min; service ceiling 5100m; range 1126km

Notes: Built as an all metal training aircraft for the Swedish Air Force, later being adopted in this role by a number of other European air forces.

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STAMPE SV-4

Description: Two-seat primary training biplane

Power plant: One 140hp de Havilland Gipsy Major 10-1 four-cylinder air-cooled engine

Dimensions: Wingspan 8.4m; length 7m; height 2.8m; wing area 18m²

Weights: Empty 501kg; max take-off 778kg

Performance: Max speed 204km/h; cruising speed 175km/h; service ceiling 4998m; stalling speed 69km/h; range 404km

Notes: Designed by Count Stampe in Belgium and placed in production for the Belgian Air Force in 1947. Production also undertaken in France for French flying clubs.

STINSON 8C RELIANT

Description: Four/five-seat cabin monoplane

Power plant: One 245hp Lycoming R-680-6 seven-cylinder radial engine

Dimensions: Wingspan 12.67m; length 8.28m; height 2.6m; wing area 23.83m²

Weights: Empty 1048kg; max take-off 1633kg

Performance: Max speed 235km/h; cruising speed at 914m, 223km/h; initial rate of climb 259m/min; service ceiling 4267m; max range 1038km

Notes: The Reliant series of touring aircraft was introduced in the 1930s and more than 1,000 were built in a variety of models, mainly differing in the type of engine fitted

SUPERMARINE SPITFIRE

Description: Single-seat fighter and fighter bomber (warbird)

Power plant: One 1710hp Rolls Royce Merlin 63 12-cylinder Vee liquid-cooled engine

Dimensions: Wingspan 11.23m; length 9.54m; height 3.84m; wing area 22.5m²

Weights: Empty 2631kg; max take-off 3523kg

Performance: Max speed at 7620m, 656km/h; max cruising speed 521km/h; range on internal fuel 1062km; service ceiling 13,106m

Notes: Probably the most famous fighter of all time, 20,334 Spitfires were built. Mainly used in the European theatre but 245 saw service with the RAAF.

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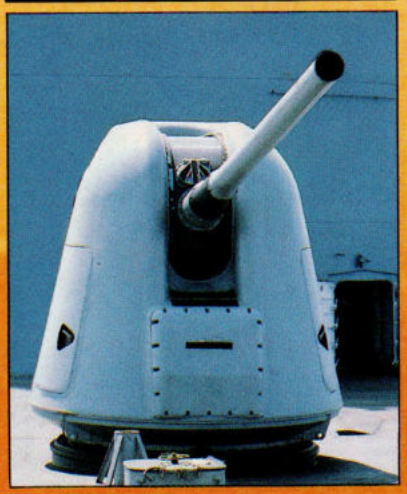

Visit the FMC Exhibit, USA National Exhibit, Booth 117
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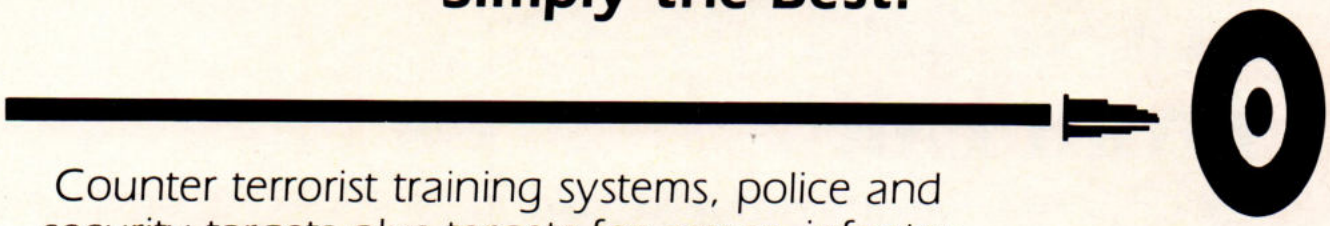

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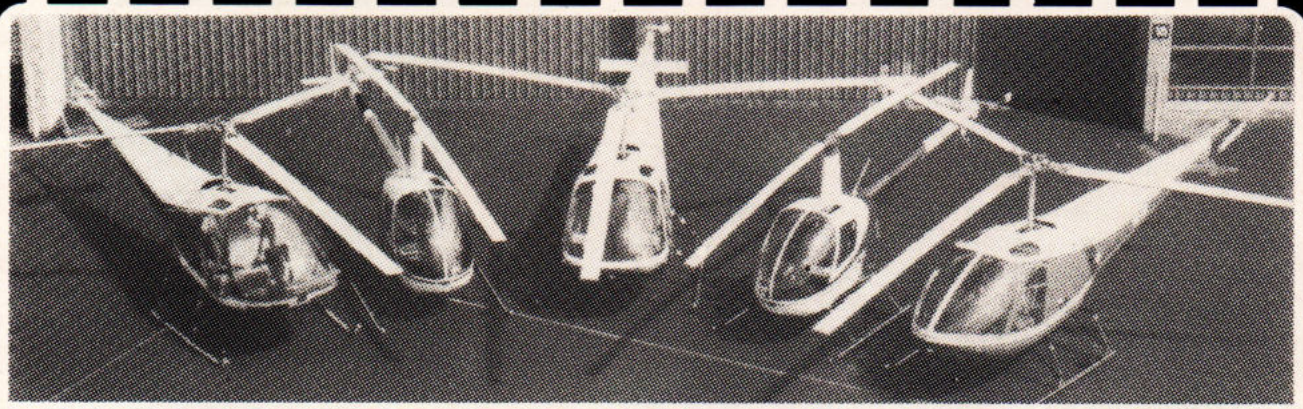

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AEROSPATIALE AS-350 ECUREUIL (SQUIRREL)

Description: Light general-purpose utility helicopter

Power plant: One 641shp Turbomeca Arriel turboshaft

Dimensions: Rotor diameter 10.69m; length 10.9m;

Weights: Empty 1027kg; max take-off 1900kg

Performance: Max speed 267km/h; max cruising speed at sea level 230km/h; hovering ceiling in ground effect 3250m; service ceiling 5000m; initial rate of climb 576m/min; range 690km

Notes: The first of the series was flown in June 1974 and since then the type has been very popular, being sold in large numbers throughout the world. By the end of 1987 more than 1000 delivered. More than 20 appear on the Australian register, and the type is also in service with the RAAF and the RAN.

AEROSPATIALE AS-355F-1 TWIN SQUIRREL

Description: Light general-purpose utility helicopter

Power plant: Two 420shp Allison 250-C-20F turboshafts

Dimensions: Rotor diameter 10.69m; length 10.93m;

Weigths: Empty 1305kg; max take-off 2600kg

Performance: Max speed 272km/h; normal cruising speed 224km/h; hovering ceiling in ground effect 1800m; range 705km

Notes: Essentially similar to the single-engine Squirrel but fitted with two Allison turboshafts, offering better performance and greater load-carrying capacity. May be fitted with 20mm cannon and rocket launchers for fire support role.

AGUSTA A-109

Description: Six/eight-seat light utility helicopter

Power plant: Two 420shp Allison 250-C20B turboshafts

Dimensions: Rotor diameter 11m; length 13.03m;

Weights: Empty 1418kg; max take-off 2600kg

Performance: Max speed 311km/h; economical cruising speed at sea level 231km/h; max rate of climb at sea level 493m/min; service ceiling 4968m; max range 573km

Notes: The A-109 series was designed by Costruzioni Aeronautiche Giovanni Agusta SpA in Italy as a high-speed, high-performance, twin-engine helicopter, the first of the type flying in 1971. Since then the type has been very successful and has been sold to a number of civil and military operators.

BELL 206B JETRANGER

Description: Five-seat utility helicopter

Power plant: One 400shp Allison 250-C20B turboshaft

Dimensions: Rotor diameter 10.16m; length 9.5m

Weights: Empty 680kg; max take-off 1451kg

Performance: Max speed at sea level 225km/h; max cruising speed at sea level 214km/h; hovering ceiling in ground effect 3871m; max range 579km

Notes: First of type flown in January 1966 and built in substantial quantities in USA, and licence built in Italy and Australia. More than 7000 built for civil and military use, being known as the Kiowa in Army service.

BELL 206L LONGRANGER

Description: Seven-seat utility helicopter

Power plant: One 500shp Allison 250-C28B turboshaft

Dimensions: Rotor diameter 11.28m; length 10.13m;

Weights: Empty 980kg; max take-off 1882kg

Performance: Max speed 232km/h; cruising speed at sea level 229km/h; hovering ceiling in ground effect 2499m; range at sea level 628km

Notes: The Bell 206L is a development of the JetRanger with an up-rated engine, the fuselage lengthened by 0.63m, increased fuel capacity and a larger rotor. More than 800 have been built. In military form it is known as the Texas Ranger and can carry various light machine guns and rockets.

BELL 412

Description: 15-seat utility transport helicopter

Power plant: One 1800shp Pratt & Whitney PT-6T-3B-1 turboshaft

Dimensions: Rotor diameter 14.02m; length 12.70m;

Weights: Empty 2964kg; max take-off 5397kg

Performance: Max speed at sea level 240km/h; cruising speed at 1525m, 235km/h; hovering ceiling in ground effect 3290m; max range 454km; range with auxiliary tanks 834km

Notes: First of the type flown in August 1979. Deliveries to customers commenced in February 1981, and licence production is undertaken in Italy by Agusta. Used extensively in oil-rig work and with the National Safety Council for search and rescue.

(Aircraft listed as appearing at the Air Show may be subject to change without notice for operational or other unforeseen reasons)

ENSTROM F-28

Description: Three-seat light helicopter

Power plant: One 205hp Lycoming HIO-360-C1B four-cylinder air-cooled engine

Dimensions: Rotor diameter 9.75m; length 9.29m;

Weights: Empty 680kg; max take-off 997kg

Performance: Max speed 180km/h; cruising speed 165km/h; rate of climb at sea level 396m/min; hovering ceiling in ground effect 3962m; range 450km

Notes: First of the F-28 series was flown in November 1960 and since then the type has been produced by Enstrom at Menominee in Michigan. Produced in a number of models with engines of varying power, and a stream-lined model known as the 280 series is known as the Shark.

KAMOV KA-32

Description: Commercial utility helicopter

Power plant: Two 2205shp Isotov TV3-117 turboshafts

Dimensions: Rotor diameter 15.9m; length 1.35m

Weights: Max take-off 12,600kg

Performance: Max speed 250km/h; max continuous cruising speed 230km/h; max range 800km; service ceiling 5000m

Notes: The first of the type is believed to have been flown in 1979. The civil variants, known as the KA-32, has been used in the search and rescue role and the military variant, the KA-27, is used in the shipboard anti-submarine warfare and utility transport roles.

MCDONNELL DOUGLAS 500E

Description: Five-seat utility helicopter

Power plant: One 420shp Allison 250-C20B turboshaft

Dimensions: Rotor diameter 8.05m; length 7.53m

Weights: Empty 654kg; max take-off 1360kg

Performance: Max speed at sea level 272km/h; max continuous cruising speed 255km/h; max inclined climb rate 579m/min; hovering ceiling in ground effect 4877m; max range 594km

Notes: Originally known as the Hughes 500, this series was built in large numbers for the US Army. Since then it has been developed through a number of models to the 500E.

PHILLIPS PHILICOPTER MK I

Description: Two-seat light utility helicopter

Power plant: One 145shp Continental 0-300 six-cylinder air-cooled engine

Dimensions: Rotor diameter 7.77m; length 6.65m; height 2.54m

Weights: Empty 476kg; max take-off 748kg

Performance: Max speed at sea level 145km/h; max cruising speed 137km/h; economical cruising speed 112km/h; max rate of climb at sea level 365m/min; service ceiling 4880m; range with max fuel 370km

Notes: Designed and built in Newcastle, the first of the type was flown in 1971. Subsequently placed in production, fitted with a 160hp Lycoming 0-290 engine.

ROBINSON R-22

Description: Two-seat light helicopter

Power plant: One 150hp Lycoming 0-320-A2B four-cylinder air-cooled engine, derated to 124hp

Dimensions: Rotor diameter 7.67m; length 8.76m;

Weights: Empty 361kg; max take-off 590kg

Performance: Max speed 190km/h; cruising speed 174km/h; initial rate of climb 366m/min; service ceiling 4265m; max range 386km

Notes: First flown in August 1985. Has been very popular and more than 50 registered in Australia. Now available in two main models, R-22B BETA, with a skid undercarriage, and R-22 MARINER, with floats.

SCHWEIZER 300C

Description: Two-seat light general purpose helicopter

Power plant: One 180hp Lycoming 0-360-C2D four-cylinder air-cooled engine

Dimensions: Rotor diameter 8.18m; length 7.03m;

Weights: Empty 465kg; max take-off 861kg

Performance: Max speed 169km/h; max cruising speed at 1525m, 161km/h; hovering ceiling in ground effect 2316m; max range 410km

Notes: Originally known as the Hughes 269, this series was introduced in October 1956 and has been produced in large numbers and sold throughout the world, as well as being licence built in Italy.

ULTRALIGHTS

A503 Drifter
Australian Aviation Works Karatoo/Karaone/Karasport/Spacewalker
CFM Shadow
Flying Flea HM-14
Hughes Lightwing GA55
Mantis
Pegasus Skylink
Sadler Vampire SV2
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GLIDERS

Schleicher ASW22
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ALL-TERRAIN VEHICLE

The Lockheed P-3 Blue Sentinel airborne early warning aircraft has several advantages over comparable platforms, but one stands out. It can track intruders over land as well as it does over the sea.

Already in full operation with the U.S. Customs Service, the Blue Sentinel is exceeding guaranteed performance points by 25%. Its sensible design features the integration of a high-mounted antenna design with the P-3 airframe, the U.S. Navy's AYK-14 computer and Sanders' Miligraphics digital displays.

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A7-092
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A7-027
27

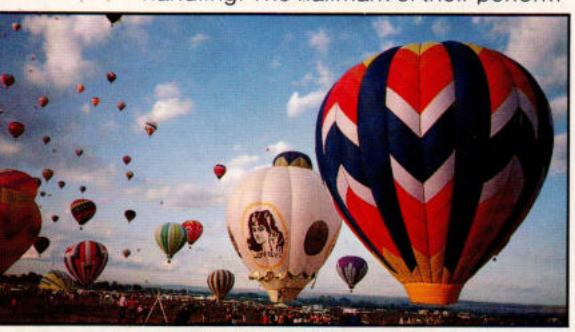
Champion, Chris also flies a Pitts Special, which he puts through an amazing sequence of aerobatics, including barrel rolling his Pitts around another aircraft. Chris first represented Australia in aerobatic competitions overseas in 1972, and he is presently trying to raise funds to take his aeroplane to compete in the "Olympics of the Air" at Alberta, Canada, later this year.

PARACHUTISTS

Miltary formation teams also come without aeroplanes, as in the case of the parachute teams from the Australian Army, the Royal Air Force, the Canadian Forces and the Royal New Zealand Air Force.

Australia is represented in the performances by the Red Berets, who are all instructors at the Army's Parachute Training School at the Nowra Naval Air Station on the New South Wales south coast. The Army is responsible for all parachute training in the Australian Defence Forces. The name Red Berets derives from the paratroopers' distinctive maroon head-dress. Made famous by the Parachute Regiment in the UK, the red beret is now worn in the Australian Army by staff of the Parachute Training School and our major parachute unit, 3 Battalion.

The Royal Air Force's Falcons team is the premier military parachute freefall display team in the United Kingdom, now into its 23rd season. The Falcons provide a stunningly spectacular display of free fall parachuting and canopy handling. The hallmark of their performance is their ability to demonstrate the precision, accuracy and self-discipline required to take a closely stacked team of 12 into the smallest of target areas, often in the middle of busy cities. The 15-man team comprises instructors from the RAF's No. 1 Parachute Training School at RAF Brize Norton.



Canada is represented in the military parachuting displays by the Sky Hawks, the Canadian Forces' official parachute display team. Team members are all regular or reservist members of the Canadian Armed Forces, and are chosen each year for a seven-month tour during which they perform at more than 50 locations throughout Canada. They have also performed in Bermuda, France, West Germany and Belgium; this is their first visit here.

The multinational line-up is completed with New Zealand, and a team of instructors from the RNZAF's Parachute Training School.

Parachuting of a unique nature is demonstrated by the National Safety Council of Australia's pararescue teams. These are rapid-response crews who can parachute directly into the scene of an emergency, either inland or up to 900km off the coast. The pararescue jumpers carry an extensive equipment pack, and can provide medical aid and co-ordinate further assistance, often in the form of supply drops from the NSCA aircraft. A new dimension to the NSCA's pararescue activities demonstrated at the Air Show is paradogs, which parachute out of the aircraft attached to the pararescueman.

SCALE MODELS

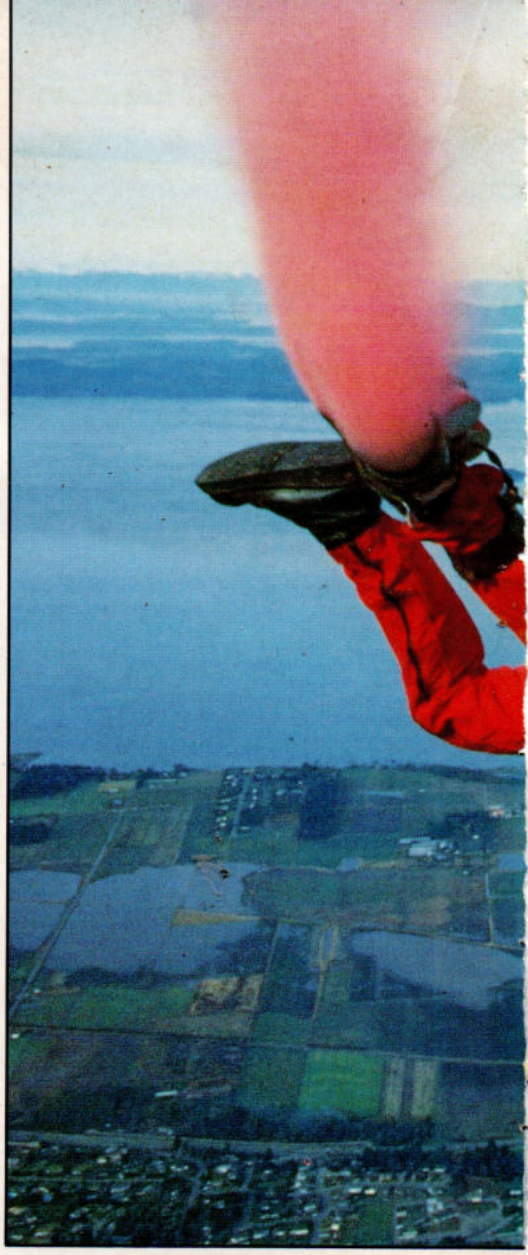
The "little people" — the radio control modellors — are also an important part of the Air Show, and many international R/C modellors have come to Australia for an Aeromodelling Pageant being held in conjunction with the Air Show. The aircraft taking part are every bit as spectacular as the real thing! Brought from the United States especially for the show is a massive one-fifth scale flying model of a Second World War B-25J Mitchell bomber. It has a 4m wingspan and is powered by two 100cc engines. Also from the US is a pair of one-sixth scale F/A-18 Hornets.

BALLOONS

The most spectacular of the ballooning activities at the show (weather permitting) is a mass launch of some 20 balloons at the start of each public day. Launched from the southern side of the runway, they drift away to wherever the wind takes them. But before they do, several of the balloons take hang-gliders aloft, to be released from a height of about 600m for a demonstration of the capabilities of these craft.

Throughout each public day there are also continuous displays of balloons being inflated, and demonstrations of tethered flight from a special balloon area in the northern part of the display site.

Whatever your interest in aviation, you can see it all at the Australian Bicentennial Air Show. By the extent and range of aircraft on show, it is truly the greatest aviation event ever held in Australia — and perhaps unlikely to be repeated for another 200 years!



Clockwise from top, spectacular freefall team, modellers, the Skydancers, NSCA rescue helicopter, RAF Falcons parachute team and the soaring spirits of hot air balloons

THE WILLPOWER

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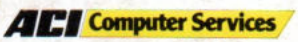

Carlton United Breweries (NSW) Pty Ltd Coca-Cola Bottlers Hertz Australia Kodak (Australasia) Pty Ltd National Australia Bank Power Ford Streets Ice Cream Pty Ltd Videoplus

MILITARY PARTICIPANTS

Australia
Royal Australian Air Force, Royal Australian Navy, Australian Regular Army

Overseas
The armed forces of the following nations are participants in the Australian Bicentennial Air Show: Canada, Netherlands, New Zealand, Papua New Guinea, United Kingdom, United States of America

ACKNOWLEDGEMENTS

Authorities and Organisations

Association of Australian Aerospace Industries Austrade Australian Bicentennial Authority Board of Fire Commissioners of NSW Bush Fire Council Civil Aviation Authority Department of Main Roads Hawkesbury Agricultural College Hawkesbury Agricultural Society Hawkesbury Race Club Hawkesbury Shire Council Hawkesbury Tourism International Air Tattoo (UK) NSW Department of Corrective Services NSW Department of Health NSW Police NSW Traffic Authority Society of British Aerospace Companies Ricoh DBE Australia St John Ambulance Brigade State Rail Authority of NSW Telecom Urban Transit Authority of NSW US Department of Commerce

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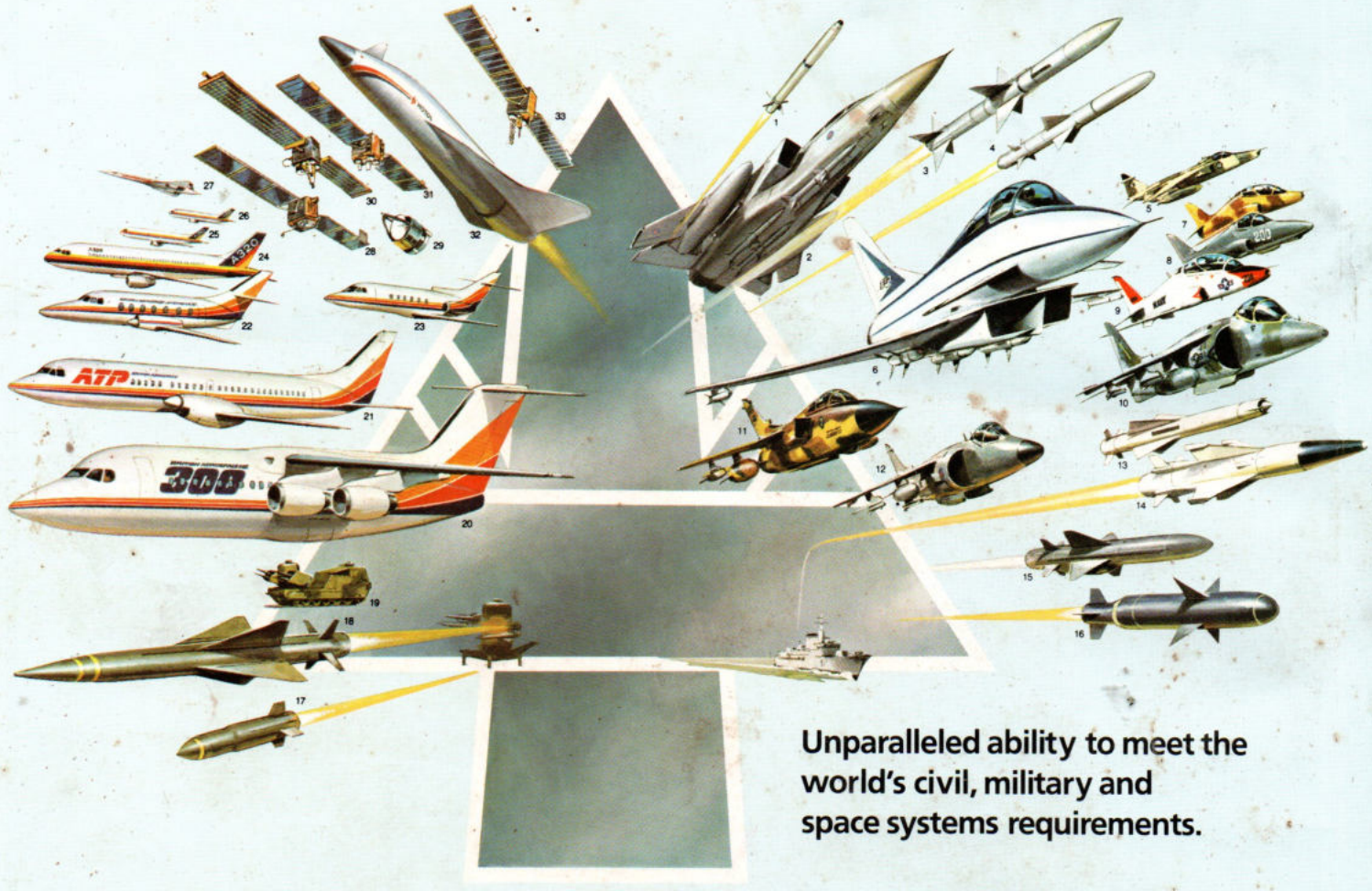

Unparalleled ability to meet the world's civil, military and space systems requirements.

1. ASRAAM (Advanced Short-Range Air-to-Air Missile)
2. Tornado Air Defence Variant
3. Sky Flash all-weather air-to-air missile
4. ALARM (Air-Launched Anti-Radar Missile)
5. Jaguar supersonic tactical strike aircraft
6. EAP (Experimental Aircraft Programme)
7. Hawk 2-seat trainer/ground attack aircraft
8. Hawk 200 single-seat fighter
9. Goshawk jet trainer for US Navy
10. Harrier II advanced V/STOL combat aircraft
11. Tornado all-weather strike aircraft
12. Sea Harrier carrier-borne V/STOL combat aircraft
13. Sea Dart shipborne area-defence missile
14. Seawolf shipborne anti-missile system
15. Sea Eagle long-range sea-skimming anti-ship missile
16. Sea Skua lightweight anti-ship missile
17. Swingfire long-range anti-armour weapon
18. Rapier area low-level air defence system
19. Tracked Rapier mobile low-level air defence system
20. BAe 146 family of regional jetliners
21. ATP (Advanced Turboprop) airliner
22. Jetstream 31 regional turboprop
23. 125-800 business jet
24. Airbus A320 single-aisle jetliner
25. Airbus A310 wide-body jetliner
26. Airbus A300 wide-body jetliner
27. Concorde supersonic airliner
28. Inmarsat II maritime communications satellite
29. Giotto scientific research satellite
30. Olympus communications satellite
31. ECS (European Communications Satellite)
32. HOTOL re-usable satellite launch vehicle
33. Skynet military communications satellite

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